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SHORT MANUAL
OF THE
BATH MINERAL WATERS.

SECOND EDITION.



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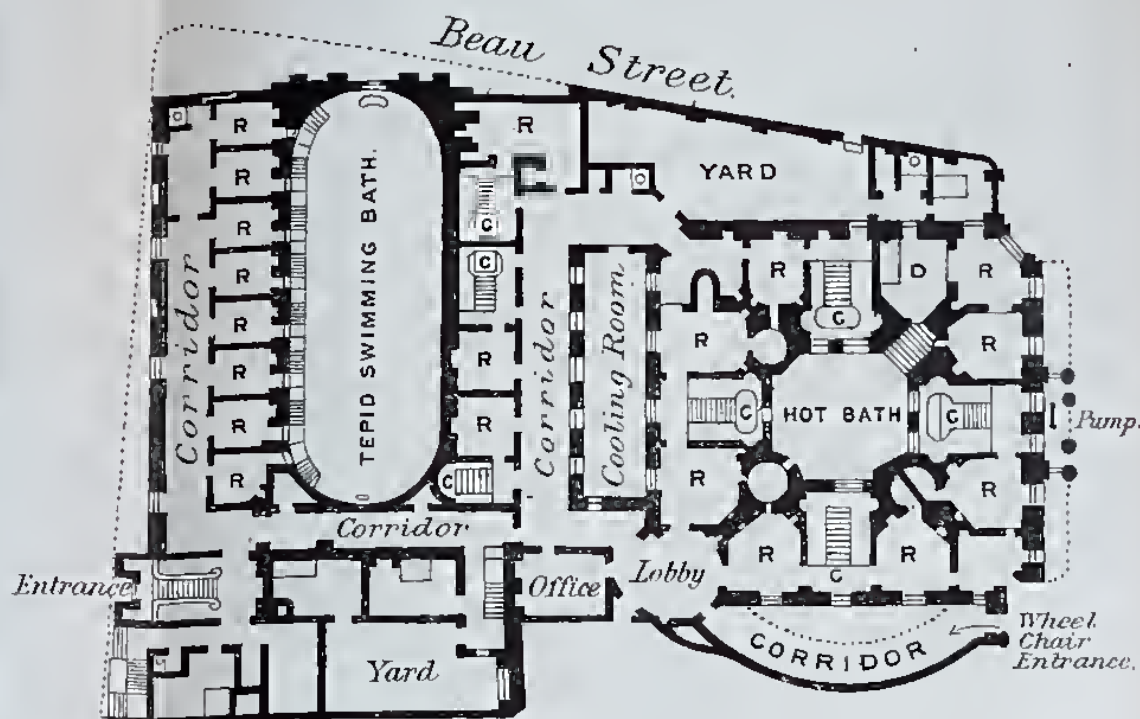
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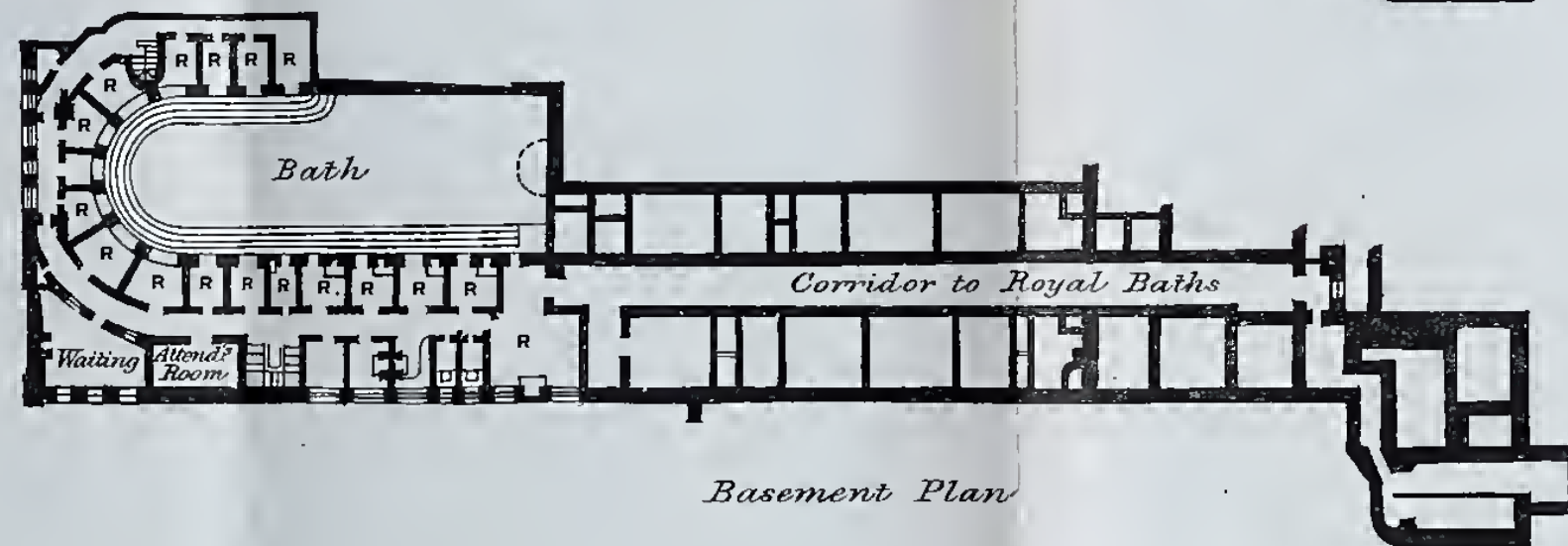
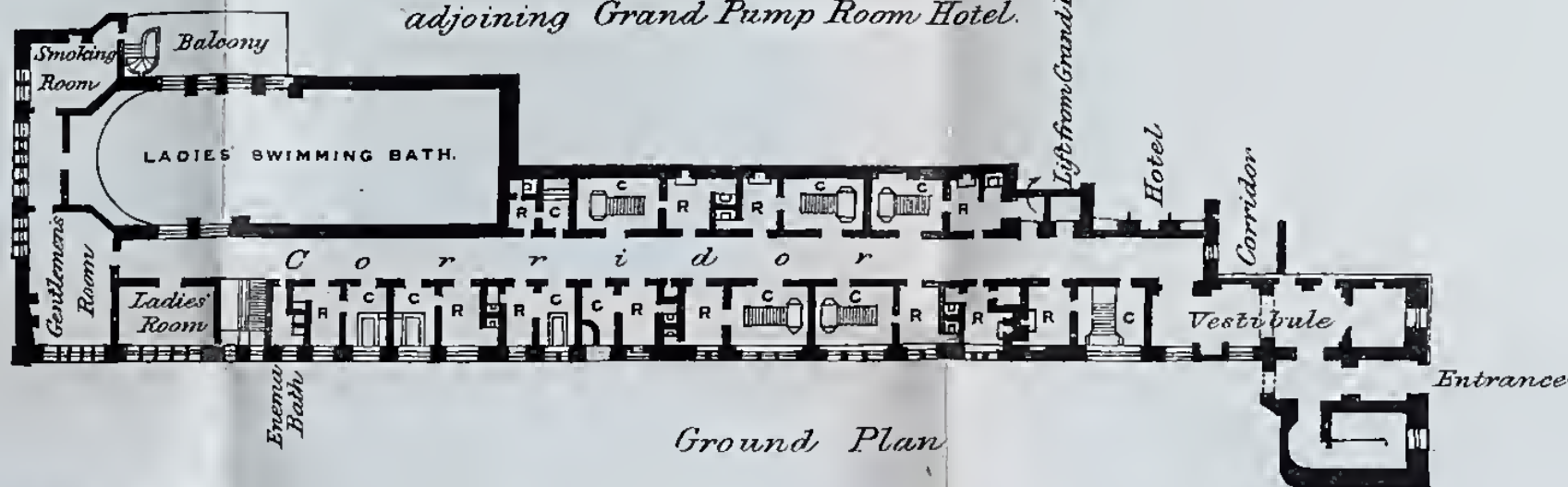
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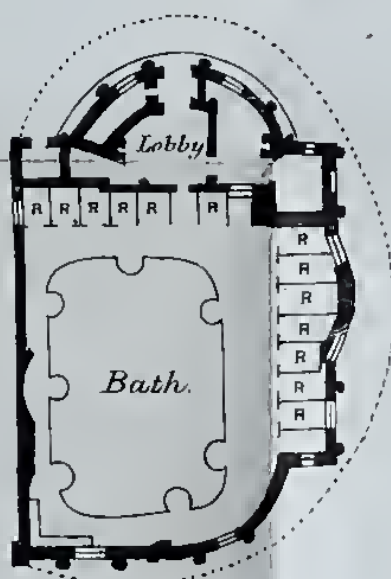
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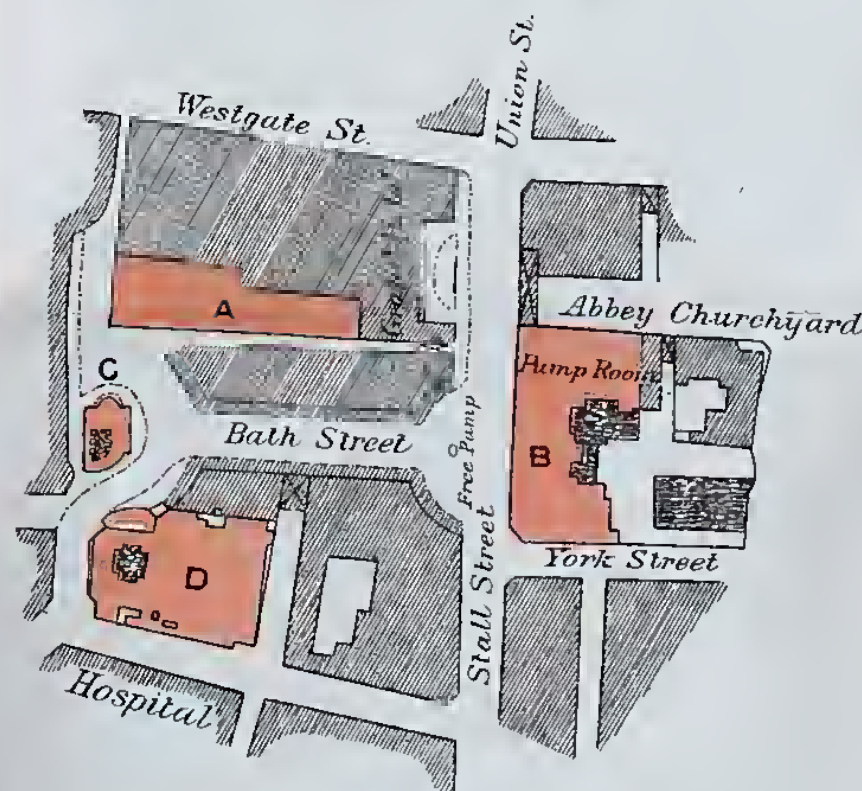
THE CROSS BATH.



R Dressing Cubicles.

No. 5.

BLOCK PLAN OF BATHS.



A is site of New Royal Baths.
B is site of King's & Queen's Private Baths.
C is site of Cross Baths.
D is site of Royal Public & Private Baths.

DRAWN EXPRESSLY FOR
"THE MANUAL OF THE BATH MINERAL WATERS,"

BY

Arthur W. Fox

[SOLD SEPARATELY IN PAPER COVERS, SIXPENCE.]

A
SHORT MANUAL
OF THE
BATH MINERAL WATERS,

BY
ARTHUR E. W. FOX,
M.B., F.R.C.P., EDIN.

*Physician to the Royal United Hospital, and to
Bellott's Mineral Water Hospital*

SECOND EDITION WITH PLANS

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A WORD PREFATORY.



THE second edition of the small MANUAL here offered to the profession and the public, so far as the medical portion, (for the most part,) is concerned, is based upon my own personal observations.

The Bath Waters have never been used, either with so much confidence, or by so many patients as at the present time, and that number is increasing day by day and year by year.

I have given only a very succinct section on their medical character, and that chiefly for those whose object primarily is to obtain practical knowledge of the therapeutic effects of the Bath Waters.

Since my first edition was issued the "Continental System" of Baths has been opened to the public, thus not only materially increasing the bathing accommodation, but greatly enlarging the importance and advantages of the waters themselves, by combining, with ordinary and approved methods, all that scientific research and medical observation have proved to be of such incalculable value in foreign spas and foreign practice. Thus it comes to pass that, from the enormous volume and the high temperature of our waters, all that the combined systems are capable of can be carried into effect without limitation of any kind.

I have avoided statistics, for two reasons : first, when the increase in the number of patients is so rapid, figures quickly cease to represent the facts. Secondly, the Baths Committee meet the want by the occasional issue of such facts as the occasion demands.

Mr. Gatehouse has made a new analysis "in order to estimate the gaseous constituents." These constituents, in conjunction with the present system and application of the waters, assume an importance which cannot be overrated.

It has been frequently represented to me that a clear and distinct plan of the baths would save perplexity to bathers. To meet this want I have given a block plan, with a key section, so that the entire system may be seen at a glance, and each bath discerned at once, without trouble.

For the historical portion of my work I am to some extent indebted to a friend.



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INTRODUCTORY.

HISTORICAL AND BIOGRAPHICAL.

—o—





Introductory Notice.

THE literature of the Thermæ of Bath has been so prolific, especially during the last half century, writer after writer following upon each other's footsteps in rapid succession, that the question may be asked us by others, which we have not failed to ask ourselves, How far it might be worth while to add to its bulk, and to the number of those by whom it has been contributed? Well, one obvious reply is that "we have a right, equal, at any rate, to that of any of our professional brethren, to produce a treatise on the Bath waters." That, however, is not *the* reply we shall make to the question. If we had no better answer to give, no better reason to advance, this *Manual* would not have been written.

The recent action of the Town Council (the practical trustees of the Baths) in the development of the bathing establishment, the introduction of new appliances, and the elaboration of new and important scientific methods; all these, whilst they will tend greatly to modify the present therapeutic practice in connection with Bath water cases, will

at the same time be open to the danger of empiricism, and in many cases to the wildest and most ignorant experiments. The great danger in the use of the Bath Waters in every age has been their empirical and ignorant application; in a word their abuse, and not their right, consistent, and legitimate use. The entire medical literature of the Bath Waters gives ample proof of this fact. One of the great dangers arises from persons using the Bath waters without medical guidance; in other cases, that half-knowledge, inexperience, and absence of discernment of many of the profession, especially in earlier times, induced and still induces reckless and empirical use of the Bath Waters as a curative agency. We do not admit the force or the truth of the sinister axiom that "at forty a man is either a fool or a physician," because at forty a man may be both, or he may be neither.

There is little doubt that the earliest historical and medical annals of the Bath Waters afford important experience to the physician of to-day.

The earliest known writers on the Bath Waters knew little scientifically of their component parts. Turner (the earliest writer) was in many respects in advance of his age. A man of acute intellect, with a passion for study, and an almost intuitive knowledge of European Botany and Herbal, he did something towards advancing the practical knowledge of the Bath Waters. What he has written upon the subject is exceedingly interesting from a bibliographical point of view, at any rate.

“ The Preface of the Author vnto his welbeloued neighboures of bath, Bristow, Wellis, Winsam and Chard.



THE most part of al flocking birdes, of the whiche nombre are Linnettes, Goldfinches, Sparrowes and Turyes, if they chance vpō any good plenty of meat, they cease not locking and calling, if they heare any of their kindes, be it neuer so far of, vntil they have brought thē vnto that meate which they have founde, beyng taught of their nature, whiche almighty God grafted in them, when he shope them and made thē to do so. Then how vnkind were I beyng a reasonable creature, & hauing the lesson taught me as wel as byrdes, both by the lawe of nature, and by the written law of God in his holy Bible, that whensoever I get any plenty of any good thing, that I should dele or at ye leste offer vnto other of my felowes some part thereof, if that after that I had trauayled thorow Italy and Germany, and had found there many thinges for you verye good and necessary, if I should not at the lest offer vnto you suche good things as I haue founde; Whilse I studied Physick in these forsayde countres, I sawe manye very holsom bathes there, the vertues & properties whereof in healing of manye sore and otherwyse vncurable sicknesses,

I have learned partely by experience, partely by reding of good writers, and partely by conferring with the best learned men that I could find there. The names therefore of these bathes, the places and the vertues of the same, leste I shoulde seme vnkinde, haue I now declared vnto you in this litle booke, whereby after a maner, I lock and call all you that haue any disease that can not be healed without the helpe of a natural bath. I haue also written so wel as I can of the bath of Baeth in England, to allure thyther as manye as haue nede of such helpe as almighty God hath graunted it to gyue: wherof that I wote of no man hath written one word yt euer I could rede.* Wherefore if that I write not so perfily of it, as som perfit idle ouerseers would that I should haue done: I truste that all honeste men will pardon me because I had no helpe of anye writers that wrote of it before me. And because it chanseth oft tymes that diuers men goyng about to heal a curable disease, for lack of knowledge howe to vse their medicines, and by vsinge of euel diet, make the same ether vncurable, or ellis store up an other mucche worse than the former was; for the auoyding of suche mischances, I haue written

* It is to be remarked that Turner is practically accurate; but we believe that in the archives of the Royal College of Physicians, there is a complete and earlier Manuscript, written by Dr. John Caius, the second President of the Institution, entitled *De Thermis Britannicis*, which has never been published.

at large what diet all men shall kepe in the bathes, & how they shall prepare themselues vnto them, and ordre themselues after that are cummed out of the same agayne. Furthermore because in the tyme of bathing in certayne men, certayn grefes and diseases arise ether by the reason of their coplexion, or of the nature of the bath, for their sakes that haue not alwayes money to hyre a Physicion, I haue written remedies against such diseases and grefes, as commonlye vse to vexen men in the tyme of their bathinge. If that I shall perceyue y^t ye do thankfully receyue these my laboure, ye shall haue shortly (God willing) an other booke of the natures of all waters, & certayn rules how that euerye man maye make artificiall bathes at home, whereby he may both kepe and deliuer him selfe from manye sore and greuous diseases. Fare well.

From Basil the X. Martij, In the yeare of
our Lorde, 1557."

Turner was a man, unfortunately, who, with a genius for science, imagined himself to be a profound theologian, born to correct the heresies and to reform the corruptions of the age. Gainsborough seemed to be unconscious of his powers and genius as a painter, and imagined himself to be a great fiddler. So in like manner Turner, whilst making his scientific studies an accidental or secondary pursuit, frittered away the dignity of his genius in violent and useless fanaticism. It seems almost impossible to read his calm and wise remarks on

scientific subjects, and to believe that they proceeded from the same man whose passionate diatribes exposed him to the persecution of Mary, and drove him to seek protection in foreign countries. Indirectly, no doubt, we are indebted to his banishment for the *Herbal*, which, after three centuries, remains a monument of scientific accuracy, artistic beauty, and typographical excellence. In scientific investigation he was patient, wise, and imperturbable. In the theological controversies of the day he was ignorant, contentious, querulous, lacking indeed all the great qualities needed in a religious reformer. He shocked the feelings of many of his reforming contemporaries by his levity and almost blasphemous ridicule. His hatred of Rome and Romanism betrayed him into the habit of denouncing doctrines and practices which were the common heritage of the Church derived from primitive times. This habit was fatal to his reputation as a churchman, and sometimes even exposed him to the imputation of (undeserved) insincerity. But we have to deal with the man of science, and in that capacity we recognise in Turner the man of genius, the calm and patient investigator, and to all intents and purposes the father of Bath Waters Literature.



“Of the Antiquity of Bathing.”



WHEN Bathing began to be of use, or who first recommended it to Mankind, no Records that I know, mention or afford us any Light to discover.

Probable it is, Men's Curiosity and reason put them first upon making the Experiment. It is very natural for us to believe, rational Creatures, when they found their *blood* heated by the scorching Sun-Beams, should soon imagine, that *Bathing* in cold Water must clean, cool, and refresh them; as also by a Parity of Reason, that warm *Baths*, in weak and cold Constitutions, must strengthen, comfort, and relieve them. Thus, by Use and Observation from repeated Experiments of this kind, Men became by little and little, better acquainted with the Virtues and Advantages of both hot and cold *Baths*. We find frequent mention of *Bathing* in *Holy Writ*, and *Homer** one of the oldest profane Authors we have, tells us, that *Ulysses* and his Comrades bathed first in the Sea, and next in warm Water, to refresh themselves after a Fatigue, before they dined. That *Baths* have been of very ancient Use in the *Eastern* countries, is attested by *Plutarch*, *Strabo*, *Diodorus*, *Siculus*, *Pausanius*, and most of our antient Historians and Poets, who make

* Iliad 10.

frequent mention of them in their Works. The modern Authors also of Note in Physick, *Andr. Baccius de Thermis, Mercurialis*, in his *Gymnastics*, and the old Authors *de Balneis*, are full of Instances of the Uses the Antients made of their Cold, Temperate, and Hot Baths.

The *Romans* in a more especial manner, greatly improved this Part of *Physick*; very noble and magnificent Publick Baths were erected at the Charge of their Emperors, who frequently bathed in Publick to ingratiate themselves with the People. Some of these Baths are said to be so large that they resemble great Cities†; and if we can believe *Ammianus Marcellinus*, they are of that Extent as to deserve the Name of Provinces. It was upon this Account *Agrippa* built 170 Publick Baths in *Rome*, at his own Charge for common use. And *Pancirollus* tells us, there were 856 Baths at *Rome* at one time. *Prosper Alpinus*‡, who lived at *Grand Cairo* some Years, acquaints us, that the Inhabitants of that city had a great many very magnificent Structures for Bathing, which were frequented by the *Egyptians* when he was there. We are also very well assured from Travellers, that all over *Turkey*, Baths are of great use among the *Mahometans* to this day: Nor are our antient Physicians silent on this Point; as we may be satisfied at large, by the Writings of *Hippocratus*,

† Vid. Pancirol, de rebus deperd. et invent. p. 93.


‡ De Medicina Ægyptiorum, lib. 3. cap. 16.

Galen, Ætino, Trallianus, &c., where the manner of Bathing in all their different Baths is very amply described."

This preface is characteristic of the writer when his mental faculties were exercised upon scientific subjects, and if we except a tendency here and there to indulge in a witticism or a humourous analogy, so common to the age, the matter and manner are indicative of an earnest and benevolent disposition. Anthony à Wood denies him all claim to merit of every kind, but that is only another way of saying that his ribald and coarse buffoonery in reference to Rome and Romanism, and all that he thought tended in that direction, was so repugnant to Wood's sense of dignity and propriety, that he would never look upon the better side of Turner's character. The following extract may be regarded as the earliest attempt, or at any rate the earliest known attempt historically, to formulate a theory of the constituent elements of the Bath Waters. It is at once an example of the crude knowledge of the period and the little that was known of the practical application of the Waters in cases of disease. But there is this to be said for Turner, his professional opponents in medicine denounced him as a quack, whilst his theological opponents, with more reason, regarded him as a wild, un-subdued fanatic. That he was eminent in medicine is proved by the fact that he was appointed physician to the Protector Somerset, and that he had availed himself of every known means of the period

at home and abroad to master his profession. It has been stated that he practised in Bath, but that is not so, as he himself distinctly admits. Indeed he knew nothing of the Baths or the Waters until after his admission to Holy Orders, when he had ceased to practice, but still pursued his scientific studies:

*“An addition vnto the Booke of
Bathes.*


 HERE as I wrote before in the boke of Bathes, the vertues and commodities only of that bath of Baeth, which is in the strete besyde S. John's hospitale,* because I had no full tryall by my owne experience with what minerall bodies the other two were mingled† and mixed withal, but onlye learned by experience of my frendes, who had by their labour and trauayl tryed out, that there is some alum mixed with some brimstone in the Kinges bath, and some salt-peter mixed wth brimstone in the crosse bath. I thinke it best to communicate to my countre men it that I have lerned of my frendes, as I have communicated before it that I have learned before by my owne experience and sure knowledge.

* The Cross Bath.

† Mingled.

“ The mind of Archigenes concerning naturall bathes.

Taken out of his workes by Actius the noble Greke Physicion.

F natural bathes some have salt-peter in them as chiefe minerall and predominate or salt-peter by it selfe alone, some salt, some alum, some brimstone, some yron, some copper, and some have erthpitche called Bitumen. Some of these bathes are mixed with two of these thinges, but the common vertue of them all is to drye vp. Some of them do both drye and heat verye muche. Some besyde that they do drye, bind and drawe together as bathes of alum where it is chiefe ruler in the bath: and so do also for some parte saltishe bathes, and they that have y^e propertie of copper. And they are good and profitable for all bodies which are moyst and colde against nature, and for such diseases as have longe continued, wherefore they are good for al kindes of diseases in the ioyntes, the goute in the fote, palseyes, the diseases of the kidnes, shorte winded men, for breakinges or burstinges that had nede to have a hard pece of fleshe to growe ouer them, for runninge sores, for longe inflammationes, and at length growen hard.

“Of bathes of salt-peter and salt.

BATHES that have salt-peter and salt or salt in them, either in the hole or for the most parte, are good for the head and for him that is vexed with the rume, falling into his breste, and for him that have the dropsey, and all kind of swellinges.

“Of Alum bathes.

BATHES that have alum in them, that is, either onely alum or alum for y^e most part, are good for them that spite or vomite blood, for the stomach that is much disposed for to vomite, and for them y^t are greued with to much flowinge of the emroddes, and for weomen that have their natural sicknes out of dew order and tyme, or are purged that way to muche, and for suche weomen as oft tymes bring furth their byrth before their tyme, no open or manifest cause knownen thereof. They are good for them also that swete to muche, and digest verye sloulye, and for swellinges of the legges. They are good for great veynes that are swelled to an vnreasonable bignes.

If it be trew that was reported vnto me of these two bathes, ye maye know by it that I have written now, for what diseases they serue most speciallve, but if anye man dout whether they have these minerales in them or no, they maye cause them to be stilled and tryed out accordinge to the learninge of Philosophie.

“ Of the nature of the bathes.



SAWE that there is some salt-peter in the crosse bath by a tryal y^t my frende shewed me, but y^t profe y^t was shewed me for the tryal of y^e presence of alum in the Kinges bath, liked me not so well as the other did. Wherefore it were well and honorablie done of some worshipful or honorable man to cause these bathes to be more fullye tryed by learned men y^t can skill in such matters, y^t thereby men knowyng the trueth, every diseased Person may more boldelye go into that bath which he knoweth to be most fit for the healinge of his disease. And if any man or woman be so poore or sicke y^t they be not able to go to the bathes of Baeth, it shal be wisdom to cause an artificial bath to be made at home by the aduise of some learned and expert Phisition, who maye put into his artificial bath, brimstone, alum, salt-peter, salt or copper accordinge vnto the nature

of the disease of his patient. As for an example: If the patient have to hard sinewes, and his necke be either stiffe or stand a wrey, or be pulled backward, or if his skin be defyled with scabbes, scurfe or anye other filthie matter, or be greued with humores falling into ye yointes, or with hard milt, or have any hardenes in the liuer or mother, or have the palsey in any parte, or the sciatica, or be greued wt the itche, he may put brimstone into ye bath, wt herbes appropriate or properlye perteyning to the healinge of the same diseases, and they y^t have their health indifferetly and riches, to bear their cost, may go to the bath that hath most brimstone in it. But if the patient have the headache or be vexed with the rume falling into his breste, or have a moyste and waterish stomache, or the dropsey or any kind of swelling, let him put salt-peter and salt into ye bath with herbes good for that disease. It shal be good also to make their bath of sea water, sodden with herbes conuenient for the same purpose. And if the patient be diseased with spiting or vomiting of blood, or be muche disposed to vomite, or be to much greued wt the flowing of the emroddes, or if wemen have their natural sicknes out of dew order and tyme, or are purged y^t way to much, or oft times bring furth their byrth before their time, no manifest knownen thereof, or swete to much, or digest sloullye, or are troubled with swellings in the legges, or have their veynes swelled to an vnreasonable bignes, let ye Physicion put into the sicke mannis bath alum,

and such herbes as are good for that purpose. And let them that are riche and have strength to go to the natural bathes, enter into it that hath most alum in it.


But these artificial bathes will do no good, neither the other natural bathes, if that men or weomen, more nyce than wyse, will only be bathed v. or vj. dayes, for they must be bathed iij. wekes or a moneth, every day ones at the least, a good dyet obserued in the meane tyme, and the body beyng purged before the enterance into the bath. And they that use such artificial bathes, had nede to swete in the bathes and in their beddes afterwarde well warmed, and kepe them selves from cold, they must also go in to the bath fasting, and neither eat nor drinke in the bath. It were nedeful also that they purged their bodye before they enter into the bath, every daye either naturallie or ellis by some suppositorie or clister."

The foregoing extracts are given not simply as a curiosity or example of archaic English, but to show the crude and imperfect conception entertained by the learned men of the day, as to the composition and medical qualities of mineral waters. They show moreover, with singular distinctness, the standpoint from which must be viewed the scientific knowledge of the earliest historic period, and enables us to compare with it the successive stages of advancement in a clearer and more accurate appreciation of the chemical ingredients of the

waters, and their true application to human diseases and infirmities. It shows clearly also that element of empiricism which prevailed in the days of Turner, when the *medico* flattered himself that he had only to find out the constituent elements of some natural product, and at once he could compose by artificial means an equivalent capable of effecting almost the same results. Apart from the occult effects of mineral waters which cannot be altogether explained, it is manifest that an almost total ignorance of the chalybeate qualities of the waters prevailed, which rendered even an approximate equivalent impossible. But, again, a most notable fact is here to be remarked, namely, that Turner makes no mention of the waters being administered internally, and it is clear that only external administration was adopted at the period when he wrote, a limitation of such vast importance that analogy and comparison almost dwindle to the vanishing point.

Whether at any previous period the waters were administered internally or not we have no historic evidence to prove. In the absence of such evidence it appears probable that they were not. It is scarcely reasonable that some of the early chroniclers and annalists would have failed to record the fact if the habit of taking the waters had ever prevailed; and both Turner and his contemporary Jones were by no means ignorant either of the chronicles or the current traditions of their day.

Jones: His theory and practice.


 F Turner is to be regarded as the "Father of Bath Waters Literature," Jones, who was his late contemporary, is entitled to the distinction of being the first physician who practised in Bath, and as the earliest known writer on the practical application of the Waters in disease. The title of his work *The Bathes of Bathes Ayde*, as it is quaintly called, is to most people incomprehensible, but our readers will see that there is nothing far-fetched or mysterious about it. It is the simplest form of expressing the nature and character of the Waters, namely the Aid of the Baths in cases of disease. Guidott in referring to Jones and his book says:—

"About the same time also one *John Jones*, an honest *Cambro-Briton*, frequenting the Baths for Practice, composed a little Treatise of them, which he calls *Bath's Aid*, in which are some Things not contemptible, though in a plain Country Dress, and which might satisfy and gratify the Appetite of those Times, which fed more heartily and healthily too, on good Beef and Bag-Pudding, than we do now upon Kick-shaws and Haut-gusts; yet nothing of the true Nature is there discovered, only, as almost in all former Writers of Baths, chiefly Catholick, a

strong Stench of Sulphur, and a great ado about a subterranean Fire, a fit Resemblance of Hell, at least of Purgatory."

It is essential that as Jones was the first physician of whom any record can be discovered as having practised in this city, we should be able to trace something of the nature of his treatment. One thing is certain, although the contrary has been frequently asserted, that drinking of the waters is an old custom, Jones's practice in this respect being much more rational than that of a later generation of physicians.

Raison d'être.

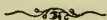
" WILL not staye but proceede forwardes (in so reasonable maner as I may in so doubtfull matters) tw showe how the Bathes of the Citie of Bathe, will ayde such as neede them: and therefore I suppose it is worthily termed Bathes ayde, if onely to your ayde for wante of other remedy you will vse them, and not as brutishe and senceless persons frequent them. For as the learned Lactantius sheweth in steede of things defensible, against outward chaunces, gyuen vnto the vnreasonable beastes: vnto man as a farre more excellent gyfte, the vnspeakable wisdom of our creatour hath bestowed reason: therefore accordinge to reason in tyme if thou haue neede, frequent them,

Historical and Theoretical.

“**B**UT least there might more in this work be sought, then the meening therof doth extend; you shal not onely finde what sicknesses the Bathes of Bath helpeth, but also, by what reason and meanes the same is obteyned, how it may be acquired, and therewith approued. A doctrine of sundrie Clarkes elsewhere attempted, and in diuers tongues, and sortes handled: Some hath shewed the benefite of the Bathes in Italie, some in Germanie, some of Spanie, some of Afrike, &c. and that diuersele for diuers causes, and sundrie effectes. But there is not one that hath written of ours in England, Brytayn, sauing Doctor Turner, who in his brief view, (as he himselfe confesseth) and discourse of sundry Bathes, hath remembred ours onely of Bathe, albeit, so barely, as fewe, or none, is put therby to the consideracion, of the full entents. For he hath neither shewed, the antiquitie, cause of their heate, reason of theyr force, &c. Nor what the persons that vse them, ought to know, and obserue, all the which in this worke, that beneficially be noted. But forasmuch as euery thing that is entreated of, must fyrst be defined and distinguished, seing that the propertie of euery definicion is, to shew apparantly to the sences, the matter entended, & that in such compendiose

fourme, and ordre, as what is needfull it containeth, and what is superfluous it leaueth: as euery destination, in his propre branches spreadeth, therefore of Tullie cheefe of all latyne elegancy vsed: & which although we be far inferiour, yet in wyll, to do that myght bee profytable, nothing behynde.

“Naturall bathes be those, which flow thorow the bowels of the earth, taking theyr effectes, of the vertue, of such things, as they runne by, and receue power of, for many infirmities most auaylable.”



Ancient Names.



“**A**RTIFICIALL Bathes be those, which bee made by knowledge in Phisike, eyther for the dispersing of humours, locked in the parts, or els for the strengthening of the membres weakened, estesones to be renued, of these also there be diuers kyndes, of diuerse qualities, and temperatures. But bicause our entent is, especyall to entreate of the bathes, of the citie of Bathe, in ye countie of Somerset. Albeit we wyll briefly touch Buckstones, sainat Vincents, & hallywell. Fyrst edified by Bladud, calling it after his owne name, Kayer Bladin, and after Kayer Bâthe, as Matheus Westmonasterientis sheweth agreing to our fyrst natieue


tongue, Brittysh, now improperly called Welsh, for Kayer signifyeth fortres or walled citie, as is easye to be gathered by the monuments themselues, in all partes of this lande, of which for the better testimonie, we shall recyte one or two (omitting sixe hundred) as they come fyrst to our remembrance, beginning at the vttermost cofyne, in the borders of Scotland: although then, and long after, it was one monarche, and tongue: Kayer Leil, the which as yet hath not lost the name, of his founder Leil, as if you would say, Leils forte. Likewyse Yorke was named after his fyrst builder Ebranck, Kayer Ebrancke, Ebrankes forte. Westchester was fyrst called, & is yit with the Brittaines, Kayer Leon Gaur are dur dur, of Leon Gaur, that mightie Gyante, ryler then of that soyle, as if you would saye, Leon Gaurs fortres, vppon the water, that is on the River Hauon, or water, which the Sea ther ouerfloweth, all y^e which the Brittysh tongue, and maner of the place confirmeth. Moreouer fyrste, more than two thousand yeares passed, Excester was, and yit it is named, in theyr Records, Kayer pen Hoel coyd, Howels cheefe fortres, Kayer pen sant, the forte of the head Sainet, Kayer pen Ruthe, the forte on the read head, and lastely Kayer Yelke, fortres, on the Ryuer Yelke, which now corruptly they call Exe. All the which at the request of maister Whoker of the sayd citie, (a gentill man not only of great learning, but therewith for his vertues, of great credyte) I turned as you haue hard, forth of the

Brittish, into the Saxon or English tongue, at my fyrst being ther, as may appeare in his hystorie dedicate to the same, most elegantly penned, which before that, was of none of the Saxon or English citizens vnderstanded, nor of any other that I could learne. Thus much I thought good to note, albeit some perhaps wyll thinke it vnpertinet, to the purpose propounded, leaping ouer the style before they come at it, varyeng farre from our mynde, in so doinge, for we think it a matter very requisite, as doth moste sort of the learned, that such notable monuments be reuiued, bicause some haue ben so doubtful of the Analogie of words, which often be corrupted, and no meruayle, for vppon some parte of vs Brittaines, fyrst tryumphed the Romainys, calling many things as them lyked. Then the Pictes, after them the Saxons, then the Dans, and lastly the Normains, all sence Iulius Cæsar his tyme, euery sort seeking theyr owne fame, and continual glory, as they might.



The Bath Springs.



“ HE cheefe Spring of Bathe, is in the churchyarde, then dedicated to Minerua, and after constituted the Abbay, of the Monkes of the order of saint Benedict, as saith Bede, Basyl, and Bale, in *historiarum libris* Created first by Blædin Cloyeth, or Bladudus

Magus, that wyse Magician, a Brittain, the ninth king after Brute, about the yeare of the world, according, to the accompte of the Scripture, 3080, before the Incarnation of Christ, 890. Helifæus Prophet then in Israel."



Early theories of Causation.



"**M**ILEUS the Philosopher, hath spoken in this case, and hee said y^e cause through which the waters of Bathes be heated, is none other, then a winde, heatinge in the depth of the earth, and in the hollownesses which be in the bowels of the same. Wherefore that heat reboundeth upon the water, & so it commeth forth hot."

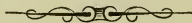
"Some of them saye it is Allume, and the reason with which they are moued, is, bicause the fyre is perpetuall, and necessarily ther is required, some sound nourishment, which should last longe, and that they saye, is Allume, bicause it is hard, and compacte of substance: It cannot easely be consumed. Vitruuius was the Authour of this opinion in his eight booke. But this opinion is false, for there is onely a double substance, which may be the nourishment of this fyre, one truly oylie and fattie: and the other thin and drye, replenished with much ayer, but the one easily

catcheth fyre, & long keepeth it: & the other although it be easly kindled, yet it keepeth not y^e fyre long, as it appeareth in styres, strawe, & chaffe kindled, and like matter. Let vs now see whether Allume (as some would haue it) may bee reduced to the one or the other, or noe, truely I cannot see, how it may be reduced to the firste, seeinge it hath no oylie thing in it, nor fattie, nor to the second, because allume is of a stonie substance, although it be drye, yit that drynesse is earthy, and not ayery. And if it should be in the fyre xx. yeares, it would never be inflamed, as you may prove if you will not beleue mee. Wherefore the opinion of Vitruuius is false. Georgius Agricola in his booke which hee hath written, *De subterraneis*, which is truely, a very fayre, and most learned booke, as be all the other, which that learned man hath diuulgated, sayeth, that the subica preseruing fyre vnder the earth, is Bitumen, for to this, he sayeth, some thing muste be subica, and the feeding of this fyre, is required to be fattie, that it may easly be taken with fyre, and this is not desired in bitumen, as it appeareth of Naphta, wherof commeth our petræoleum, which is a kinde of bitumen, and if it shall bee new, it catcheth the flame from farre, so that in the fields of Mutina, sayeth Fallopius, where it is gathered, plentifully, it is necessary for them which gather it, to leaue their candle farre from the place, wher they do gather it, and they gather it in certayne places vnder the earth, vnto which they goe downe by

many steps, and they be most darke places, so that are constrayned to carrie with them a light. Therefore seeinge bitumen may easely be kindled, and is plentifully found in places vnder the earth, as plenty of Naphta gathered in the aforesayd place doth shewe: it is very like that it is the subica, feeding such fyre.

“But let vs omit this, and let vs come to the naturall, and it is that the matter feeding fyre vnder the earth, is Sulphur, as experience it selfe teacheth. For at Bath, sensibly it may be proued, that brimstone, boyleth in the water, yet I do not deny, that Bitumen also, is not the continuall feeding of fyre, but I affirme, that fire in some places, is fedde by brimstone, and in some places by Bitumen. So that I will conclude, howe that necessarily, the waters which doo waxe hot through Sulphur, haue smell and tast of Sulphur, as the bathes of Bath hath, of which folowing more largely shal be entreated, and those of Bitumen haue smell and tast of Bitumen. But when as al bathes, haue not immediatly thone of these, hence it is, that some waters be found, which doo represent neyther Sulphure, nor Bitumen, as at Buckstone. And when they passe through stonie places, they doo lose straightway, if they haue Sulphure or Bitumen, bicause some waters do not boyle in Sulphur, do waxe hot in the jorney. Therefore such waters tast not of Sulphur, the same I say of Bitumen, seeing there be some waters, which do waxe hot through it, that they passe

through places, in which Bitumen burneth, and those which do waxe hot, thus wise, doo not of brimstone nor bitumen. Howbeit these waters if not immediately, yet mediately they waxe hot, by reason either of brimstone or Bitumen, preserving the heat, as in my benefite of Buckstones bathes may appeere. But here ariseth a doubt, why these fiers goe not forth, seeing fier consumeth all things, this is true, if it be not still fed, but Sulphur or Bitumen, be quickly regenerated again, therfore it is no dout, that fier hauing matter to burn on, is preserued alwayes."



Theory of the Component parts.



Sweet,	hote	1	Sooner cold	1
Salt,	in	2	de- in the	2 de-
Bitter,	the	3	gree Rouge	3 gree
Sharpe,		4	Harshe	4

The sweete taste is, sayeth *Montane in comen. de simpli. medicament. qualit.* that which is lightly gathered, delighting and pleasing the sense of the instrument, arguinge an earthy dryenes, temperately excocted, and not parched, sometime with an ayrie moysture, and sometime with a watery, therefore moderately warming, not much moysteninge, or drying, nay it shall easely be turned to nourishment, and alwayes, such kinde of strength,

or vertu shall proceed from the sweete taste, if it be simple : but if it bee ioyned with other tastes, as to the bitter or sharpe, it shall bringe foorth mingled vertues, the scope of our purpose, for the qualities of the Bathes.

The Salte taste is that, which perseth and byteth the tonge, bringing a certayne kinde of feeling of heate, by reason of earthy dryenes, in a watery moysture, thorow much heate deminished, and by such a qualitie, you may have the force of heating, drying, and persynge to the depth, bicause of much watery moysture, mingled therewith.

The bitter taste is that, which seemeth to shunne away from the tongue, something arguing, a farre greater deminishing of earthy substance, thorow heate, than in the salt tast, and therefore it shall have a greater force of heating and drying.

The sharpe taste, is that which not onely doth byte the tongue, but also dryeth, setteth on fire, and as it were, burneth arguing an earthy drynes, perfectly diminished by heat, and almost turned into the nature of fyre, therefore it heateth, thinneth, and dryeth exquisitely, also burneth and consumeth. Now foor example of the sweet taste, Sugar, honie clarified, or destilled, honie suckles, &c.

Of the salt tast, Salt, salt peeter, Sal gemme, salt water Bryne, the salt sea, &c.

Of the bitter, Aloes, Wormwood, Gaule, &c.

Of the sharpe, Pellitorie of Spayne, Brimstone, Arsemart, otherwise called water pepper, &c.

The sower taste, doth manyfest an earthy substance, not wholly over boyled, by heate, yet somewhat deminished, which substance, is mingled with very much earthy moysture, therefore such a medicine, doth coole and drye.

The rough taste, shall temperatly set on edge, and stoppe, declaring, that in earthie substance, cold and drye hath souereignitie, in this simple qualitie, yet somewhat less than the harrish taste.

The harrish taste, shall express great uneavenes, in so much, y it may seme to cosume the moysture of the tongue, arguing a manifest force, of earthie substance, in that simple, very little overboyled by heat, worthily therefore termed cold and drye.

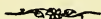
Now for example of the harrish taste, we must trye it, in vrype hedge peares, vnrype medlers, sloes, &c.

Of the rough taste, in Mirtilles, in vnrype Gaules, in the rindes of pomegranates.

Of the sowre taste, in unrye Grapes, in Sorrell, in Vergis, Syder made with wyld aples, &c. But here I would wyshe, that you should not thinke I meane so absolutelie, of the simple tastes, but y they may be ioyned, with any one of the other tastes, one two, or three, more tastes, as in the waters of the bathes. Neverthesse, we give the name, to the tast most sensiblie felt, which compound tasts, as briefly as is possible, we will express.

These mineralles, seeme yet to require some thing, to bee spoken of theyr qualities, tastes and

effects. Fyrst of Copper, which of taste is bitterish rough, arguing therefore a fretting and drying force, and therewith clensing, in the beeginning of the second degree. Secondly Iron, roughish harsh doth bynd and dry, as it appeareth not only, by the electuary dayly in use, named *Scoria ferri*, but also by the Smithes water, that they quench theyr Iron in, which is good to bee dronk of them, that have an issue of bloud. By the which you may gather, that we meane not, for that wer absurd, y^t those mineralles, be melted and commixed, with the water. But we affyrme, that theys qualities are through boyling of y^e fyre infunded, discussed, commixed, and dispersed by y^e waters runing forth, as may be wel approved, y^e which also D. Turner testifieth, what neede many wordes. The water tastes of his own nature, absolutely cold, and moderatly moist (as it is said, and shal be better in y^e Table of the things natural) is in these Baths per accidens made hot, sharp, bitter, harsh, rough, &c.



Bathing.



FASTLY we shall place in this booke, certaine *Aphorismes*, of the preparacion unto Baths, of entring in, comming out, diet, sleepe, and accidentes, with curacion of them, &c.

Acknowledge your selues, with the holy Apostle Paul, to be in the Lords hands as the pot, is in the potters, saying beefore you goe in, altogether on your knees devoutlie the prayers appointed in the ende of this booke.

Such as bee disquieted, with any Fever, being weake, slender, and leane, must abstaine from Bathes, as saith *Rol hb. de Med. aquis*. They whose temperature, is hot and drye, children, springalles, yong men, leane, consumed, also women great with chylde, must eschue the bathes, yet I am not ignorant, of y^e youth dayly frequenting the bathes, which thing not only reason forbiddeth, but also experience, for their skins thereby, become not only wrinkled. but also tawnie, especialli if they enclin, anything to choller. Every person going into the bathes, must fyrst clense y^e bodies from superfluities. All persons affected or greeved by journey, shal not forthwith enter the bathes, but that fyrst rest their bodies, by the space of a daye or two, yea or more.

That day which shal be over cold, windie, and rainy, y^e bathes shal not be approached, neither in the pestilent seasons, saith *Agricola lib. de peste* and also *Raza lib. de peste*. neither in y^e ful of the Mone saith *Rolandus*. Neither in y^e leape yeare, sayeth *Sauonarola*, bicause it is the yeare of *Saturne*, therefore in the leape yeare, you may not without great danger, use them for *Saturne* amongst all the Planets, is enemie to generacion, mans nature and good state of the bodie, bicause

the state of the living bodie, consisteth in heate, and to prove, y^e it is the year of *Saturne*, this they say. The Saturnal yeare is moved from iiii. to iiii. But y^e leape yeares is moved from iiii. to iiii. bicause every fouerth yeare is leape yeare, ergo, the leape yeare is the yeare of *Saturne*, this opinion is not only false, but also rude, and unlearned. The leape yeare is not the worke of nature, but the invencion of man, for Augustus Cæsar devided it, to make the yeare even, 365 days, vi. howres and odde minutes. But the leape yeare is the constitucion of man, and man hath not force to alter nature in the Theorikes, ergo, the leape yeare to hurte the nature of men, hath no more force, than any other yeare. In the monethes of April, Maie, June, September, and October, when the ayer is temperate, be the best tymes.

About an howre after sunne rising, in the morneing, if the disese require, drink the water out of the spring, the body afore purged, the digestion fulfilled, and the bath fyrst clensed, remaining clean vi. houres before.

So much of the water, as shall not be greevouse to the stomache, may be dronke."



Later Theories of Causation.

IT would be absurd to deny the progressive knowledge of the present day as to the cause of the thermal springs, but the knowledge is rather of a negative than a positive character. We know that the theories of Turner and Jones are absurd ; we know, moreover, that although Guidott held a more rational theory than either of them, his conjectures have been proved to be untenable. The theories advanced by later philosophers from Guidott's time down to Lyell, Murchison, and Daubeny, show by the light of chemical as well as geological evidence, where the earlier investigators were wrong, but they cannot arrive at any other definite decision upon causation.

The latest writer on the subject, the Rev. H. H. Winwood, can tell us no more than they ; and although Lyell and Murchison twenty-four years ago, whilst differing widely in opinion, gave us in clear and interesting language what they thought, we are still in the depths of uncertainty. Mr. Winwood says :—

“As regards the hot mineral waters of our city issuing in such volume and at so high a temperature (117° Fahr.) from the bottom of the basin, the source whence they come cannot so easily be traced ; suffice it to say that the generally received opinion is, that they well up from great depths,

probably through some fracture or fissure in the Palæozoic rocks, which lie beneath the horizontal covering of New Red and Lias.”—*The Rev. H. H. Winwood in the Handbook of Bath*, 1888.

We can find no clearer nor more interesting account of the springs than that written by Dr. Wilkinson in 1811.

“The hills about Bath mark the boundaries of many of the strata, one stratum dying gradually into another; so that the sides of the hills give a beautiful geological illustration of these earthy layers; and their respective dips or inclinations enable us to form a tolerable conjecture as to their thickness in any part of Bath. Thus, the water from the great freestone is by no means so pure as that which flows through the bastard species; for, as the latter lies under the former, if, in sinking a well, the spring should arise from the great freestone, it is generally so charged with calcareous matter, as to preclude its being used for domestic purposes; and if we stop the spring by puddling, and perforate the freestone to the next layer, a very fine water is generally procured.

“The irregularities of the surface of the earth occasion those currents and streams of water which we observe. If our barometrical calculations are correct, it appears that the greatest depth of the wells at Schemnitz is 200 fathoms higher than the city of Vienna: this would give the direction to any water flowing on the surface of that part of the globe.

“Although we are but little acquainted with the structure of the earth, our observations having hitherto been confined to very small depths below its surface, yet, as in these may be discovered a certain regularity of arrangement till we arrive at the granite, it has hence been supposed by some geologists that the granite constitutes the nucleus of our planet, and the basis of all our primary mountains.

“In Cornwall, from Land’s End to near Plymouth, we remark the granite, in which substance tin alone is found; on the N.W. the killas or gneiss, extending up towards Devonshire, in the southern part of which county, viz., about Plymouth, is the marble limestone, whilst towards Barnstaple it is quite an argillaceous schist, which gradually changes into an argillaceous loam between Linton and Bridgwater. A remarkable bed of clay extends from Lime to Bridgwater, so as to induce one to suspect that at some period it must have formed the bed of a river. Here the limestone of Somersetshire commences, and continues to the chalk of Wiltshire. To the miner it is of the highest importance to be well acquainted with these strata, it being by this knowledge that he is enabled to carry on his researches for different minerals: it would be absurd for any person to attempt to discover tin in Somersetshire, and equally unproductive to sink a shaft in Wiltshire, with the hope of finding coal.

“As these strata are serpentine in their course, all

springs peculiar to them will follow the same direction, when determined over hills and descending into valleys. It is evident, from the law of fluids, that if an opening should be made in the descending part of the stratum, the water will rise nearly to a level equal to the part of its course ; thus, in the shaft sunk at Batheaston for the purpose of procuring coal, my ingenious friend, Mr. W. Smith, informs me that, in perforating the white lyas at the depth of between four or five hundred feet, the spring cut into immediately ascended to an elevation of 360 feet.

“As, amongst the earths, clay is found to be the most retentive of water, if, on any of the strata containing springs there should be an argillaceous bed, any communication (natural or artificial) to the surface of this bed, the water will be retained. It is well known that an abundant spring is never found where there is a great depth of sand, without any stratum of clay to force it upwards, as in the sandy deserts of Arabia, and the immeasurable plains of Lybia ; so, upon the same principle, we rarely have springs where the surface to a great depth consists of clay. In digging for wells, if we begin with sand or gravel, water is rarely found till we arrive at clay ; and, in case of commencing with clay, we must cut through the bed to the sand or gravel, before we shall find a spring. Upon these principles draining and irrigation depend.

“With respect to the Bath hot springs, we find them flowing on a bed of firm blue argillaceous

marl, which is itself placed over the white lyas : this has given rise to a supposition that the springs may originate in the latter stratum ; for, as the Bath waters possess some properties which the white lyas, or any of the known strata which lie over it, do not possess, we may therefore presume that the warm springs are determined from a source still deeper."



Section II.

Between the time of Jones and his Treatise little is known as to the water treatment from any existing records, until we come to Dr. Edward Jorden ; but from his Treatise or Course, published in 1631, it does not appear that much advance was made either with regard to the theoretical or practical knowledge of the Bath Waters. It is true that Dr. John Sherwood, who from about 1600 to 1620 occupied the Abbey House, received patients for the Bath Waters treatment, but little, if any, advancement in their practical use was made. It is indeed doubtful whether drinking the waters formed any part of his practice. As a matter of fact, from the time of Jones until the advent of Peirce to the Abbey House in 1653, drinking the waters had ceased almost altogether as a part of the Bath Waters treatment.

Maplet, Venner, and Bave, active, and in many respects eminent as they were, did little if anything to advance the scientific and medical knowledge of the waters, and it must be conceded that Peirce in that long and careful experimental and practical application of the waters, was the founder more or less of modern practice. At first his treatment was exclusively confined to immersion whilst the drinking was administered in a tentative and timid fashion, as we shall show. Considerably more than half the cases he cites with.

so much detail, and yet not without great interest, were exclusively confined to bathing. Even after he had proved the efficacy of imbibition, he seemed to have restricted the practice to certain cases, and that apparently somewhat arbitrarily, and when, as it appears, all prejudice had been overcome by his careful study and observation, an angry controversy arose between him and Guidott, as to which of the contending parties was entitled to the largest share of credit in relation to the important results produced by the internal use of the Bath Waters. It is, however, a curious fact to note that for upwards of a century one of Peirce's cases was cited as a "leading case" of the efficacy of the internal administration of these waters. When the waters had fallen into neglect and were in danger almost of degenerating into contempt, this "leading case" was extensively quoted, and did much to restore not only the confidence, but the popularity of the Bath springs as the great "health resort" of the nation. We make no apology for quoting the case, which as one well authenticated is very remarkable in itself, and interesting as an example of Peirce's method and style.

"The case I am now about to describe had so many, and great Symptoms complicated, that I stood a while dubious to what Head mostly to refer it. But at length finding the *Cachexie* to be the last and greatest of them, I have made it one of this sixth Chapter.

"It is the case of *George Long, Esq.*, of *Down-*

side, in the Parish of *Shepton-Mallet*, in the County of *Somerset* ; three miles *Eastward* of *Wells*. His great and wonderful Recovery by the use of these *Waters*, hath been long since made publick, I shall not therefore need to repeat a great deal of his long and painful Sickness.

“It is more than Twenty Years ago, that I was first Physician to him, his Lady and Family, and its almost so long ago, that he was first assaulted with the Gout, and I find in some of my Papers, that more then sixteen years ago I prescribed Medicines for him, for sharpness of *Urine*, *Stone* and *Gravil* ; as well as *Antiarthritick* Remedies, for he seldom had a Fit of the *Gout*, without that of the *Stone* also, and both frequently seized him. But in the year 88 and 89, and so forwards, for two or three Years together, he was seldome free from great Pains, which were diffused all over his Body, from part to part, from Joynt to Joynt, where was wedged in, this calculous matter ; that his Finger became crooked, his Right Knee, Hipps and Back motionless. He was so contracted, that he could not be extended in his Bed, much less (if the Pain would have given leave) could he have been set upright. In short, he became (as we call it in this Country) Bedrid.

“He was lifted in a sheet from one side of the Bed to the other, and from place to place, not easie without, nor well within : His Thirst importunate, his Appetite and Stomach lost, his Skin shriveled, and discoloured, his Face Meagre, his Hair gray ;

his Flesh wasted, his Muscles fallen all the Body over, he could have thrown the Calf of his Legg over his Shin-bone. With all this he had a perpetual sharpness of Urine, nay all the Juices in his Body, had such a propensity to Lapidescency, that his *Water* being left (but a few days) in a Bed-Urinal, it was crusted at the sides and top, as thick as a Half-Crown, with a porous kind of Stone, like that of a *Prunez*. In this Condition, he was with difficulty brought to *Bath*, *April*, 91. He began with drinking the *Waters*, hot in the Morning from the *Pump*, at Meals cold, (for he drank not then, nor hath he done since any *Malt Drink*.) In a Week's time his Thirst abated, and the sharpness of Urine lessened, his Stomach began to return. After a Month's Drinking he bathed between whiles, which much eased his Pains. He could in the *Bath*, suffer his leggs to be distended a little. About the end of *May*, he returned Home with this begun advantage, but carryed the *Waters* with him, and constantly sent for them. About the end of *August* he came hither again, and stay'd six Weeks or two Months, Drinking and Bathing as before. In the mean time he gathered some Flesh and Strength, and some small Ability to go, though Cripplishly. In *November* following, his Gray Hairs began to fall off, and new ones succeeded, he says more, that some of the Gray ones returned again to their Colour, which way ever it was, by *Candlemas* he had few or no Gray Hairs but a good Head of soft brown Hair, such as he

had when he was about Five or Six and Twenty, which grew so fast, that he cut more then an Inch, every Month or Five Weeks. Even now (bating a little Baldness upon the Crown, for he is on the wrong side of Fifty) it looks like a Border of Hair, which I have seen formerly worn, before whole Heads were so much in use. To perfect this so well begun Recovery, he took a House and lived here for the most part of the year 92, about which time his Toe Nails which were hard, ragged and scaly, began to be thrust off by new and smooth ones ; his Arms and Hands recovered Strength ; he had much freer motion of his Joynts, his Muscles plumpt ; he was daily more and more erect, and every Bathing stretched him half an Inch. He hath now a Fleшы, Hale, habit of Body, a vigorous Eye ; and a Ruddy, Plump, Youthful Face, especially when he mixes *Sherry* with his Water, (which he will sometimes do.)

“In fine, he hath had no Fit of the Gout to lay him up long together, nor the least touch of the *Stone*, or Sharpness of *Urine*, since he left off Malt-Drink, and made these *Waters* his constant Beverage. It is pitty to leave out one material Circumstance. An Unbelieving Knight, that knew him well before, hearing of this miraculous Recovery, came purposely to his House to examine the Truth of it ; with his own Eyes he soon might have seen it, but would not Credit it till he had asked his Lady, whether she found him grown young again ? She modestly (and sharply enough)

answer'd, I believe if I were dead, he would marry again.

“Though all this is manifestly known to be true, yet little or nothing of it is believed by the Advocates for other Mineral Waters, who envy, and would eclips the Reputation of these. Nay their industrious Reports have killed him many times, and many letters have been sent (some to me) to know the Truth of it. Nay, I have been forced to shew him to some (Ladys especially) to convince them ; to which (I thank him) he hath not been unwilling to consent.

“To save the Charge of more such Post-Letters, and to cure this incredulity (as well as to serve his Country) he was likely to have been sent up, to serve in Parliament for this City.

“He is able enough to bear the Trouble of attending the Business of the House, nor was there any reason to fear that the *Bath Waters* would have lost their Reputation, if he should have dyed there, though both these things were objected, in a Letter from some that would have had another chosen. To evince the first, it was scarce two Months before the time of Election, that he rode from *Bath* to *Oxford* in a Day, which is 48 computed Myles, and above 50 measured ones ; and but few days before that, went from hence to his own House, (which is 12 or 14 Myles) after twelve a Clock at Night, went to Bed for two or three Hours, rose again, and dispatch'd a great deal of Business before Dinner.

“ And for the second, those Gentlemen that (for their own ends) pretend so much Kindness to, and concern for the Reputation of these Waters, may know (even by some of the foregoing, and following Observations) that the Credit of them is not to determine with Mr. *Long's* Life. For though they have wrought a very exemplary Cure upon him, yet I hope they do not expect, that they should make him (or any Body else) immortal, or invulnerable, or not lyable to other Accidents, common to Humanity. But weak Arguments seem strong to those that are willing they should persuade, at least when they are urged to such whom they think easie to be persuaded, and not only keeps the Strength he hath got, but improves it daily.”

The closing paragraph is an angry hit at his formidable antagonist Guidott, whose malicious shafts were being constantly aimed at Peirce and the results of his practice.

A writer in the *Universal Magazine* of 1747, says—

“ The drinking of these waters, tho’ as Dr. Jones assures us, practised in his time about 150 years ago was so universally disused, that it was quite out of practice at the Revolution: for it was not till the year 1691, in which year Mr. George Long was miraculously cured of a constitution, broken with the gout and stone, that people began to drink these waters universally, as a great alterative, strengthening, and balsamic medicine.”

“ You should drink these waters hot from the

pump, or as hot as they can be brought to your lodgings every morning fasting; by which means that volatile spirit which circulates in them is perceived, and recruits the animal spirits, restores a weak stomach, affords a nourishment suitable and sufficient to low constitutions, and communicates a salutary motion and pleasure to all the fibres of the body, in whose contraction consists what we call life, but their total resolution is immediate death. The properest time for drinking these waters is between six and ten in the morning; and provided they do not load the stomach and make you sick, they cannot lie too long in you, and therefore I would advise to take two hours time to drink them, otherwise they will pass off too quick, or else purge by stool, which will prevent their good effect. As to the season of the year, they are like other medicines, always good when necessary to be applied. But care must be taken not to catch cold when they are drank in winter. And it is remarkable that the weather cannot be too hot for the use of these waters. As to the continuance of their use—many have with great success drank them longer, but I should advise them five or six weeks at the most, at a time, and if the case requires it, after a proper interval, repeat it again for the same time: but nature has so ordained it, that they who drink too much, generally lose their appetite, and bring upon themselves a sick stomach, which is easily remedied with a few doses of bitter wine in a morning, and a gentle purge.

Some patients have found benefit by repeating one glass warm at the pump, about 5 or 6 in the evening or at their lodgings going to bed."

From the next paragraph it will be seen that the doses prescribed were excessive, the result of reaction. The evil continued to increase, until it was checked by the more rational and scientific practice of the second Oliver Harington, Nugent, Gusthart, &c.

"The quantity is from a pint to two quarts, in the morning, according to the direction of the physician, whom I advise you always to consult, drinking no more than half a pint at a time, but never exceed one-third of a quart, except in case of the gravel and stone in the kidneys, where a pint is sometimes drank with success."

Another merit may be attributed to Peirce, and that is, that until his time only the Spring and Autumn were thought by the profession to be safe for bathing and drinking the waters. The case of Viscount Stafford established the fact that so far as safety and efficacy were concerned, with ordinary care, all seasons are alike.

In the early part, it may be said the first half, of the eighteenth century, drinking the waters in the old pump-room was a mere habit in which the beaux and fine ladies indulged to while away the time, or as a pretext for love-making, or an appointment in the gambling saloon. There was nothing real about it. The gentleman sipped it and spat it out with disgust whilst the lady scarcely touched it

lest she should wash away the cochineal from her ruby lips. It was all a contemptible sham, and it was not until later in the century, as we have seen, that the evil resulting from it began to abate, and its maleficent influence ceased to operate.



Section III. Treatment.

GENERAL.




WE will cite a few of the disorders—typical disorders—to which the Bath Waters are peculiarly applicable. We are most anxious to guard against misconceptions of any kind, more especially against that empirical heresy which proclaims them to be good in cases where their efficacy is more than doubtful, or it may be absolutely prejudicial. In this respect we share the opinions emphatically held and expressed by some of the oldest physicians, as well as by the later men of eminence, such as Drs. Henry Harington, William Falconer, and his grandson, Randle Wilbraham Falconer, as well as Spry and Wilkinson. They were men eminent in all respects; men who, trained and educated in the best schools of their day, were watchful of the dignity of their profession, and in their practice observant and conscientious, not confusing *meum* and *tuum*.

The treatment of some forms of nervous affection, notably sciatica, by electricity in combination with the Bath Waters, is by no means of recent origin, having been extensively used, 40 years ago, by the late Mr. E. L. Bagshawe and Mr. John Palmer Tylee. But, like all other special remedies, it requires

to be used with judgment and discretion, being a form of treatment possessing the highest value when justified by the symptoms, which must be determined by the physician.

Rheumatism.

HE beneficial effects of the Bath Waters have never been more fully experienced than in cases of subacute and chronic rheumatism, and the records of the Royal Mineral Water Hospital, in addition to the evidence of private practice, will prove the assertion that more benefit is to be derived from bathing and douching in this painful affection than from any other remedies hitherto recommended.

In cases which are the sequel to an attack of rheumatic fever and in which the acute symptoms have subsided, drinking the waters and the use of the tepid immersion bath, combined with the under current douche, invariably give marked relief and tend to prevent the disease from becoming chronic (Falconer). In other cases the Aix douche at a temperature, ranging from 92° to 96° Fah., combined with massage, will be found efficacious; and, when the patient's strength will permit of it, the general thermal vapour bath may be given with advantage. At one time the existence of a cardiac murmur was

supposed to negative the mineral water treatment, but the results of daily experience have long proved these views to be erroneous. Mitral murmurs, whether due to stenosis or incompetence, certainly constitute no bar to the employment of thermal treatment; the same rule also applies to a murmur indicating aortic obstruction or regurgitation, so long as there is no evidence of failure of the left heart. All that is required in the thermal treatment of such cases is that the temperature of the bath, either immersion or Aix douche, should be carefully regulated, and that in the employment of the latter, with massage, the region of the heart and lungs should be carefully avoided.

It is, however, in chronic rheumatism that the Bath waters are especially to be considered worthy of trial. In cases where the joints are swollen, painful, and stiff, also in lumbago, sciatica, and neuralgic rheumatism, the water administered internally and the baths at a carefully regulated temperature, either Aix douche with massage or general immersion, combined with a gentle under-current douche, prove most beneficial.* During the past fourteen years we have had under our care at Bellott's Hospital a large number of cases of chronic rheumatism, and can therefore state, with some authority, that in the large majority of these

* In Sciatica and Neuralgic Rheumatism the application of electricity through the medium of the waters is often most efficacious, and the cure is accelerated.


cases a marked and permanent relief has ensued from purely thermal treatment, that is to say, by immersion baths combined with douching, and the internal use of the waters. Since the introduction of the Berthollet, *i.e.* natural vapour, into our bathing system, we have tested its efficacy in many cases of chronic rheumatism, both in its general and local application, and in some of these cases its superiority to the immersion baths has been conclusively established, both as regards the rapidity of its effects upon the local ailment, as well as in the removal of the cachetic condition from which the patient was suffering. In the treatment of chronic synovitis, whether of rheumatic, gouty, or strumous origin, the Bath waters have long been regarded as of great value both in the early and late stages. In these cases drinking the waters and the use of the local thermal vapour bath, combined with massage, (Billroth and Murrell) invariably prove of great benefit. The value of massage in the treatment of synovitis has been graphically illustrated by Von Mosengeil's experiments (Murrell on Massage). He took a number of rabbits and injected into the knee joints a syringefull of Indian ink. Massage was performed at intervals on the *right knee*, but the left was left untouched. At the expiration of 24 hours or more the animals were killed, and the tissues on both sides were carefully examined. The left knee joints were distended with fluid, whilst on the right side which had been

manipulated it had entirely disappeared. The lymphatic glands on the right were full of patches of Indian ink, whilst the corresponding glands on the untreated sides remained unaltered.* In some forms of muscular rheumatism and in cases where there is a certain amount of stiffness and but little swelling of the joints, the thermal vapour or the Aix douche with massage are extremely useful. In so called urethral rheumatism, which in the majority of cases is probably a septicæmic process occurring in a person of gouty or rheumatic diathesis, the water taken internally with the use of the local Berthollet vapour bath are most efficacious. In some of these patients, especially in those of a rheumatic character, the immersion baths at a moderate temperature, combined with a carefully graduated undercurrent douche, on the affected joint, are of greater value than any other kind of thermal treatment.

* We make no apology for quoting this typical experiment, which is one that will attract the general observation and interest of the profession.



Osteo-Arthritis. Rheumatoid Arthritis or Rheumatic Gout.

N few cases are the waters more beneficial than in this malady, when early applied, but success entirely depends upon the recognition of the disease in its early stage. It is well to state this distinctly, as patients frequently come to Bath suffering from advanced osteo-arthritis, and of course receive but little benefit. We are fully aware of the difficulty which is often experienced in the differentiation of cases of arthritis in their early stage. As Sir Dyce Duckworth observes, (St. Bartholomew Reports, vol xvi.) "the broad distinctions are well laid down in many books, and every student is expected to be familiar with them and to be ready to draw up a categorical list of the characteristics of each. But in the test of actual practice difficulties are not unfrequently encountered, and it then comes to pass that an accurate diagnosis is only secured by the aid which therapeutics afford."

As the result of a somewhat extensive experience in cases of osteo-arthritis we feel convinced that a large number of joint cases are "lumped together" under that heading, which, although they present the same coincidence of structural change, nevertheless differ widely from each other in their special

ætiology. We believe, however, that genuine cases of the disease are caused by some profound nerve disturbance of a depressing nature, such as over work, anxiety, worry, fatigue of over nursing, exhausting discharges, or hemorrhages, occurring in persons of the arthritic diathesis; or, as Charcot terms it, *an articular predisposition or state*, and which he likens to a parent stem from which issue two branches, gout and rheumatism, and these, though certainly not identical, nevertheless have a common relationship.

A solid and most valuable help to the diagnosis of this disease has been arrived at by our friend, Dr. Spender, ("The early symptoms and early treatment of osteo-arthritis") who has, as the result of a careful analysis of one thousand cases in the Mineral Water Hospital, observed the following symptoms, as "connoting osteo-arthritis," which, in his opinion, are beyond the possibility of doubt or failure. (a.) An increased rapidity and tension of the heart's action, the pulse ranging between 90° and 120°, and in some cases reaching 140. Since our attention has been thus drawn to it we have frequently noticed the rapidity of the pulse, but have not at present observed the tension mentioned by Dr. Spender, neither have we noticed an accentuated aortic second sound, such as would be present in case of well-marked arterial tension. (b) "The disturbance in the chromotogeneous function of the skin."


This is, we believe, a most important feature in the diagnosis of this disease, upon which Dr. Spender lays great stress. He describes the conditions as a pigmentation which occurs in 'patches' or 'smears,' which assume various hues, and affect various parts of the body. On the forehead it often runs as a light bronze smear. The predominating tint of the patches on the face, especially in the temporal region, are "lemon, orange, and citron." The skin of the neck often exhibits what Dr. Spender terms the "dirty collar pigmentation," for, as he truly observes, "the part has a lamentable look as if it were unwashed." On the body and on the limbs the pigmentation takes the form of "blotches and freckles," of a yellow or brown colour, on parts, too, where there has been no possibility of exposure to the sun. For many years we had noticed this "spotted pigmentation" in cases of arthritis; but, until Dr. Spender mentioned the matter, we did not regard it as one of the special symptoms in osteoarthritis. (c.) "Vaso-motor disturbance." This is shown by morbid sweating, which may be general or local. (a) "Special neural symptoms," which may be exhibited sensorially as neuralgia in various parts. Dr. Spender especially alludes to neuralgic pain in the ball of the thumb and on the inner side of the wrist. When this is present he regards it as a symptom of "such valuable significance," that,

in conjunction with the symptoms preceding, it leaves little doubt as to the nature of the case. Certainly, then, neuralgia or perverted sensations are of marked value in enabling us to form a correct opinion as to the nature of the arthritis under consideration, and tends further to corroborate Dr. Spender's opinion "that the arthritis is only one neural symptom among many others, and possibly not the most important." As lending further support to this view is the muscular atrophy which we have frequently noticed in the early stages, and which we agree with Dr. Ord in regarding as "an early and synchronous symptom of equal importance with the arthritis itself."

In the earlier stages of this complaint, (before it has entered upon that of hopeless ankylosis and muscular atrophy), if the Bath waters are properly applied, success will generally follow. In such patients, when their joints are swollen, stiff, and painful, the immersion bath at a temperature carefully regulated, and rapidly increased when the patient can bear it, together with the undercurrent douche on the affected part, soon produces relief. There are some cases in which it is not desirable to use the immersion bath, on account of the depression which it occasionally produces; such cases often obtain marked and permanent benefit from the application of the Berthollet vapour bath

to the affected limbs. Passive movements of the joints should always be employed, and in some cases massage and shampooing of the limbs as well as the use of electricity.* In addition to local treatment, the patient should drink the waters and take nutritive and nervine tonics, such as cod liver oil, iron, or quinine, and especially arsenic, and be placed upon a generous diet.

Gout.

N the treatment of Gout the Bath waters have always held a high reputation. During an attack of acute gout the waters in any form, either by drinking, douching, or immersion, should not be used ; when, however, the paroxysm has subsided, the sooner the patient has recourse to bathing the more rapidly will the limbs recover. It is, however, in the numerous symptoms which are due to latent gout that the greatest benefit is obtained ; and these may be enumerated as indigestion, flatulence, acid eructations, biliousness, cramps, or feeling of numbness, " pins and needles " in the limbs, sciatica and neuralgia, of various kinds, whether facial, or in the tongue, palate, or heel, palpitation or irregularity of the heart's action,

* This may be applied separately, or through the medium of the mineral waters, either in the immersion bath, or through the douche.

gouty angina, headache, vertigo, irritability of temper, general feeling of malaise and depression of spirits.

Frequently, in these cases, the water may bring on an acute attack, which affords considerable relief, mitigating the troublesome symptoms from which the patient has been suffering. By having recourse to the thermal treatment at regular periods, the intervals between the acute attacks may be materially prolonged. In the event of an attack of acute gout occurring during a course of the waters, all thermal treatment should be discontinued, with the exception of a local Berthollet, which should be applied to the affected part when it is practicable. In the majority of acute cases the natural vapour applied locally to the affected joint or joints gives marked relief by lessening the pain and tension, and reducing the swelling, and by these means the acute stage may undoubtedly be alleviated. Great care, however, should be exercised in avoiding draughts of cold air when the affected part is removed from the Berthollet, and such part should be immediately wrapped up in absorbent cotton wool and oil silk, over which a flannel bandage should be gently but firmly applied. The duration of the local Berthollet and the frequency of its repetition must depend upon the general condition of the patient and the special features of each case. It is impossible to lay down any exact rule as to the employment of the

mineral waters in cases of gout ; each case must be judged upon its own merits, as to whether the waters should be used internally or externally, or both ; whether the kind of bath employed should be the immersion, the Berthollet vapour bath, or the Aix douche, either alone or with massage. Some *indications* as to the thermal treatment in cases of gout may nevertheless be gathered by a careful review of the types of the disease, which have been so faithfully delineated by our revered teacher, the late Professor Laycock. In type number one, which corresponds with the Norse type of Milner Fothergill, the salient features are familiar to most of us, and are described by Professor Laycock as follows : “ The external characteristics are as to the blood and vascular system ; blood vessels numerous, heart large and powerful blood corpuscles numerous ; skin on malar bones highly vascular, giving a floridness to the complexion ; skin firm, fair, oleaginous, perspirable ; eyes blue ; hair thick, not falling easily ; teeth massive, well enamelled, regular, even, undecayed in advanced life. Malar bones flattened, head symmetrical, nasal bones well formed ; nose aquiline, or of mixed form ; lower jaw massive ; lips symmetrical. Form : figure for the most part tall, thorax broad at summit ; ribs well curved ; abdomen full ; muscles firm, large ; limbs large, robust ; gait erect, well poised. Nutrition : active ; digestion vigorous ; appetite great for animal food and alcoholic

stimulants; respirations deliberate, deep; circulation vigorous; animal heat abundant; locomotion active; aptitude for exercise or out-door amusements; reproductive powers active; innervation abundant; the mental powers vigorous and enduring. The diathesis tends to prolong life, it is therefore seen often after forty years." In the treatment of this type of gouty patient we cannot speak too highly of the use of the Berthollet vapour bath, and recommend it with confidence to the profession. Whether it should be used generally or locally must of course depend upon the nature of the case. As a rule we have seen marked benefit from the use of the general Berthollet bath, but in some cases it may prove too exciting to the general circulation, and in others give rise to symptoms of a depressing nature; and, when this is so, the application of the thermal vapour locally and for short periods to the affected parts is most serviceable. There is some reason to think that when patients can bear the thermal vapour generally, their recovery, is more rapid than when treated by the immersion bath. In cases of gout, with high arterial tension, as indicated by a slow steady pulse and an accentuated aortic second sound, the Aix douche, at a temperature ranging from 92° to 98° Fah., with gentle massage, is very efficacious. At the same time the arterial tension should be reduced by saline purgatives, and an occasional mercurial pill. Following this line of

treatment we have seen cases, of which we have been speaking, materially improve in every respect ; and this has also been our experience, even where there has been unmistakeable evidence of renal fibrosis and cardiac hypertrophy ; and also where, as the secondary result of the long continued strain upon the cardiac valves, through the heightened arterial tension, there has been the further complication of a stenotic or regurgitant valve lesion.

We quite agree with the late Milner Fothergill that the effect of the high arterial tension in lighting up the growth of connective tissue in the valve flaps is almost as frequently met with at the mitral as at the aortic orifice, and that when it has given rise to stenosis or regurgitation, the left ventricle is prior to the valvulitis markedly hypertrophied, a point of some importance in the diagnosis and prognosis of the case. In the latter class of cases it is a matter of obvious importance to counteract by cardiac tonics, such as strophanthus or digitalis, any symptoms of a depressing nature, which may arise through the thermal treatment. It must be clearly borne in mind that in the later stages of secondary valvulitis, when the hypertrophied heart is undergoing failure or "mural decay," all thermal treatment must be used with more than ordinary caution. Another type of gouty patient described by Professor Laycock, and which corresponds with Fothergill's Arab type is distinguished thus : "The external characteristics are medium

stature ; small muscular development ; spare habit ; mobile countenance, lively ; forehead broad, lofty ; muscular movements abrupt, jerking, energetic ; the sensorial sensibility great. This diathesis often constitutes an important element in other diatheses and cachexiæ, especially the arthritic and strumous, engrafting, when present, a predisposition to asthenia and anomalous diseases of the nervous system." These are the patients who habitually pass lithates in their urine, and who suffer from indigestion and heartburn, and from some of the numerous and most troublesome forms of neurosal disturbance. At the same time, though they may not be as liable as the first type to articular explosions and cardio-renal change, still, in some cases, which are more or less blends of both types, we find hypertrophy of the left heart, with an amount of arterial tension ; and these persons, therefore, represent a type of case, which, as age advances, seems to exhibit a tendency to take on the changes in the vascular system, and as Fothergill remarks, "to add the dangers occurring therefrom to the troubles with which they are already familiar;" and he further observes, what is in accordance with our own experience, that these hybrids may manifest at one and the same time the troubles of both types. In these neurotic patients of the Arab type it is a matter of great importance in the thermal, as well as the general treatment, to avoid everything of a

depressing nature. In such cases, therefore, a carefully graduated needle douche or reclining bath, at a temperature ranging from 96° Fah. upwards, combined with wet massage, will be found very useful; should there be any manifestations of articular gout in this type of patient recourse should be had to the local use of the Berthollet bath.

The other points in the general treatment of gout may be summed up as follows: (*a*) The avoidance of over fatigue of the nervous system whether by mental or physical work, or as far as may be possible by worry or anxiety of any kind; this especially applies to the neurotic type. (*b*.) Exercise should be taken daily, without fatigue, preference being given to riding on horseback; no exercise that we are acquainted with being equal to its effects on the uric acid formation. It oxygenates the blood, and by shaking and compressing the liver and bringing a large number of muscles into use, promotes more rapid and complete tissue change. (*c*.) The dietary in cases of gout is a matter of the utmost importance, and consists mainly in the reduction in the amount of the albuminoid elements, especially the flesh of the larger animals. When there is no marked tendency to obesity we may allow white fish, fowl, including game, such as pheasant, partridge, or rabbit, and a certain amount of fat or butter. Farinaeous food in the shape of milky puddings, and a certain amount of fruit, excepting rhubarb, which

is objectionable on account of the oxalates which it contains. It is inexpressibly irksome to some patients to be rigorously restricted to fish and fowl, and to these may be allowed a moderate quantity of butcher's meat two or three days a week. Vegetables generally, except tomatoes and asparagus, so long as they are young and tender and well cooked, are permissible in all cases. Should there be a tendency to corpulence the carbohydrates should be reduced to a minimum; and, in all cases, pastry, sugar, and candied fruits, must be avoided. With regard to the use of alcoholic liquor in the gouty diathesis, it is impossible to lay down any hard and fast rule. There can be no question that in the majority of youthful patients, as well as in those of early middle life, (unless there is some special reason which renders its use advisable), the less alcohol taken the better. To persons in middle life, or of advanced age, or to those who have been accustomed to its use, it becomes a different matter, and in such instances a certain amount of alcohol may be taken with the meals daily. For the majority, as a rule, we recommend a sound Scotch whiskey, well diluted, or a good sound Bordeaux.* Champagne is simply poison to the majority of gouty patients. But we have had patients who habitually drank a first class

* With regard to the latter, we say without any hesitation, that we have often seen great harm done to gouty patients by the habitual use of "light cheap claret."

wine of this description, not only with impunity but with distinct advantage, and it was the only kind of alcohol which appeared to agree with them. The same observation applies in certain cases to the use of an old vintage Port. Ebstein also remarks, that when there is no disposition to gout, and no obesity or tendency thereto, "certain small quantities of beer need terrify neither more nor less than wine." This we find applies to persons at, comparatively speaking, an early period of life, who are capable of taking a fair amount of bodily exercise—with the invariable proviso that the beer be of a kind containing but little sugar.* It is well to remark that in the dietetic treatment of gouty patients, it is of the first importance that everything should be avoided that causes dyspepsia, which in itself tends so powerfully to induce gout. In all cases of gout the waters should be taken internally, and in gradually increased quantities, except by those in whom it produces headache, giddiness, or any other uncomfortable symptoms. In cases of gouty catarrh of the pharynx, and in laryngo-tracheal affections of this kind we have seen great comfort and relief afforded by the inhalation of the mineral water steam, either alone, or in some cases mixed with Eau de Challes, in

* This implies that judgment must be exercised in the selection of this beverage. To the majority of persons, beer is beer, if it possess an agreeable flavour, but in every case the patient must be well advised as to the purity of the article, before he habitually drinks it.

proportions which must be determined by the nature of each case. The latter treatment especially applies to those cases which are a compound of syphilis and gout.

In addition to the purely thermal treatment of gout, massage—wet or dry, or dry rubbing (Ebstein) should be always used, it being a great help to the preservation and restoration of muscular power, and, more important still, to the removal of waste and morbid products. Whether it should be used every day or alternately with the baths must depend upon the resisting powers of the individual.



Dyspepsia.



HERE is no class of disease more generally benefited by the internal administration of the Bath waters than disorders of the stomach in their various forms.

In cases of dyspepsia, in which the patient complains of symptoms, such as flatulence, acid eructations, gastrodynia, gastralgia, a furred tongue with a foul taste in the mouth, loss of appetite, constipation, diarrhœa, or either one of them alternating with the other, cold hands and feet, a feeling of mental depression, with a disinclination to any mental or bodily occupation, the internal administration of

the waters generally produces marked benefit. Dr. William Falconer, nearly one hundred years ago, observed, "the recovery in such cases is particularly remarkable for its taking place so quickly after the commencement of the trial of the remedy ; a few days will frequently work such a change in the condition of the patient as would be scarcely credible were it of less common occurrence. The appetite is altogether restored, the wandering pains and spasms cease, the natural rest returns, and the spirits are raised to their proper pitch, the strength likewise improves daily, and the natural secretions and regularity of the body in point of evacuation are restored." We can corroborate in every particular the remarks of this eminent physician, having seen cases of dyspepsia derive more benefit from the waters than from any of the numerous remedies in the pharmacopeia, and this applies, especially, to cases of dyspepsia dependent upon gout. As Dr. Lauder Brunton in regard to such persons remarks, "gout may often be warded off by washing out their tissues," and he advises them to drink large draughts of hot water. In these cases, in addition to gastralgia and acid eructations, there is a furred tongue with a foul taste in the mouth, the motions are dark, or clay coloured from vitiated bile, and there is generally great mental depression which, in the early morning, amounts to an indefinable dread of impending misfortune. It is especially in this

class of patients that the waters, taken internally, prove of great service, first, by acting as a cordial and producing a feeling of exhilaration ; secondly, by increasing the alkalinity of the blood, and flushing out the kidneys ; and, thirdly, by promoting more rapid tissue change and the removal of waste products. Moreover the waters in their action upon the biliary secretions, when taken fasting early in the morning, and, *rapidly sipped*, stream through the portal circulation, stimulating biliary secretions, rendering viscid bile more fluid, and raising the bile pressure in the bile ducts, and so producing bilious evacuations. Many of the earlier Bath physicians entertained a high opinion of the Bath waters in the treatment of biliary and renal calculi, and in reference to this Dr. William Falconer remarks, "for these the Bath waters are of the greatest service, and I believe more gall stones have been observed to be voided during a course of the Bath waters than from any other known medicine." Bearing upon this point, our friend, Dr. Macpherson, the author of the "Baths and Wells of Europe and the Lime-sulphated Waters," draws attention to the analogy between the chemical constituents of the Contrexéville waters and the Bath waters, and as the cold Contrexéville waters are found to be valuable in the treatment of biliary and renal calculi, he remarks that Bath waters might also be used with advantage for the same class of complaints.

Diseases of the Skin.



FROM the earliest periods the Bath waters have been justly celebrated as a most effectual remedy in cutaneous diseases. Dr. Spry observes, "whatever may be the mode in which these waters produce their beneficial effects, nothing is more certain than that in cutaneous eruptions where the patient has been following the best advice for years, and where in many instances they have been deemed incurable at other hospitals, the Bath waters have produced the most wonderful effects, not only in removing the complaint for the present but in preventing a return for a long period and often removing it altogether." The forms of cutaneous diseases which are benefited by the Bath waters are psoriasis and scaly eczema, especially when they are manifestations of a gouty or rheumatic diathesis. The waters may also be used with good results in cases of lichen, urticaria, acne, ichthyosis, sclerosis of the skin and prurigo. The treatment formerly pursued in connection with cases of cutaneous diseases, was to immerse the patient in a tepid bath, gradually increasing the temperature ; and, still following this plan, we have seen cases of skin disease recover, those notably of chronic gouty scaly eczema, which had previously been under the care of some of our most distinguished dermatologists, without deriving

much benefit. In many of these cases we advise generally the use of the Berthollet vapour bath, which acts most effectively, especially in the more chronic forms of scaly disease, and in all cases, unless there is some special feature to render it imprudent, we recommend the use of the waters internally.



Diseases of the Nervous System.

THE Bath waters may be used with advantage in some forms of paralysis; those, for instance, which result from rheumatism, exposure to cold, the poison of ague, diphtheria, and typhoid fever, and also when it is caused by lead, arsenic, mercury, and copper. In these cases drinking the waters, combined with the use of the Aix massage douche or Berthollet steam bath, is most beneficial. In connection with the thermal treatment, it is often advisable to resort to electricity, but it is impossible to state what current should be employed, everything depending upon the nature of the electrical reaction. During the past thirteen years, in Bellott's Hospital, we have had several cases of lead paralysis, which have all been markedly benefited by the immersion bath and the free use of the water internally. The late Dr. Wilbraham Falconer held the theory that, in lead poisoning, the mineral is deposited in the liver, and

that by the administration of the water in frequent doses, every four or five hours, the flow of bile is increased, producing bilious motions, and by these means the lead is eliminated. It may be difficult to understand how any treatment could well be more successful than the old fashioned plan of drinking and immersion. Nevertheless, a more rapid and equally certain cure is effected by means of the Berthollet steam bath. In hemiplegia the waters have been used with benefit, but some time should be allowed to elapse before they are tried, and not while there is the least tendency to cerebral excitement, or evidence of arterial tension. In suitable cases of this sort the reclining bath at a temperature ranging from 92 to 97°, or the Aix douche at the same temperature, with gentle massage, will be found useful and comforting to the patient. In anterior poliomyelitis and in chronic myelitis tepid reclining baths, combined with gentle massage, and in some cases electricity, give good results. In cases of muscular weakness, with neuralgic pains in the limbs, the result of spinal concussion from falls in the hunting field, we have seen marked benefit from the use of the reclining bath, combined with the Scottish douche playing up and down the spinal columns. In these cases we also recommend massage in combination with electricity. In chorea the late Dr. Wilbraham Falconer held the use of the Bath waters in high esteem. In some cases in Bellott's Hospital we have

seen great benefit derived from the immersion baths with a gentle undercurrent douche to the spine. In the majority of cases, especially those of rheumatic origin, the waters have also been taken internally with advantage.




Uterine Diseases.

IN complaints of this nature, according to Spry, "the utility of the Bath waters has been long and generally acknowledged," but it is evident that everything depends upon the nature of the case. In leucorrhœa, the result of chronic metritis, especially in patients of a gouty or rheumatic disorder, for example, the douche ascendante has been recommended, and in many instances no doubt with advantage, but as leucorrhœa is a symptom of very widely different conditions, it is impossible to lay down any exact rules for the application of the waters. In the treatment of interrupted and painful menstruation the waters have always held a high place as a remedial agent, and Spry states that many instances have been recorded where every means had been tried without effect for removing retentions and suppressions prior to the successful application of these waters. It is necessary, however, to exercise considerable caution in the employment

of the waters in cases of sudden suppression from any violent cause, especially when it is attended with symptoms of cerebral congestion; in this condition, it being essential to employ active purgatives before the thermal treatment can be recommended with safety. As long as there is no pyrexia present, in cases of chronic ovaritis we have seen decided benefit from the reclining bath, and, when the patient can bear it, the shock from the Scottish douche may be beneficial. We have also found dry massage distinctly advantageous in the treatment of these troublesome cases. In defective and scanty menstruation and in ordinary cases of chlorosis the warm immersion bath, with the undercurrent douche to the spine, is most useful; at the same time the patient should drink the waters, increasing the quantity every three or four days, according to circumstances.

Anæmia & Malarial Cachexia.

N these conditions the waters are most useful. In the latter affection, when the system is saturated with malarial poison and the spleen is in some cases enlarged, there is no remedy more efficacious or more rapid in its action than the waters taken internally, and, when the patient's strength will allow of it, the use of the Berthollet vapour bath. Patients who are

too feeble to bear the vapour treatment should be given immersion baths at a moderate temperature, or recourse should be had to the Aix douche, with gentle massage.

The above are the conditions in which the waters have been prescribed by experienced authorities, and in which we, from personal experience, have found them beneficial. Some writers have recommended them for local œdema of limbs, for traumatic exudations, strumous disease of the hip and knee, and old dislocations, &c. Except in cases of local œdema caused by thrombosis, we have had no experience of the use of the waters in those conditions, but our impression is that the benefit we have seen in local œdema, and which other writers profess to have found in the above cases, may be produced by the massage and douching, and not by the special qualities of the Bath waters. The virtues of the waters have been extolled by some writers for so many divers affections, that, with faith, we might regard them as an almost universal panacea for every complaint. The same remark also applies to massage and electricity, which, though often invaluable, are frequently recommended by the ignorant and unscrupulous for all sorts of ailments without any sort of discrimination. For our own part we are too jealous of the invaluable healing qualities of our waters to expose them to ridicule, if not contempt, by advising their employment in complaints where no advantage can possibly ensue.

To bring people from a long distance, buoyed up by hopes of impossible benefits, seems to us at once cruel to the patient, and calculated to injure the reputation of what we regard as one of the most admirable spas in Europe.

We are too careful of the honour and dignity of our profession, to expose it to the charge of empiricism. The Bath waters are an invaluable blessing vouchsafed by Providence for the good of mankind, and not to be the element of speculative ignorance or unscrupulous avarice.

Analysis of Bath Water

as it flows from the Spring,

By PROFESSOR ATTFIELD, F.I.C., F.C.S.,

Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, author of a Manual on General Medical and Pharmaceutical Chemistry, &c.



FIND that one gallon of Bath Water contains in round numbers 168 grains of the various solid substances on which its medicinal virtues depend, and 69,944 grains of water, together forming 70,112 grains, or 70,000 grain measures. The water is therefore slightly

heavier than rain-water, in the proportion of 1001'6 to 1000'0.

The analytical data on which the foregoing statements are founded are given in the following tables. The first table shows the name and quantity in imperial grains of the various elements, etc., contained in one imperial gallon of the water, and is given to meet the requirements of medical practitioners, chemists and druggists, and analysts generally.

The second table gives the forms in which these elements, etc., are probably contained in the water, and will be more useful to the public.

NAMES OF THE ELEMENTS, ETC., IN BATH WATER,
AND THE QUANTITIES IN GRAINS IN ONE GALLON.

		Chemical		
Name.		Definition.		
	Calcium	... Ca	...	30.9523
	Magnesium	... Mg	...	4.0112
	Sodium	... Na	...	13.4546
	Potassium	... K	...	3.0044
	Ammonium	... NH ₄2370
	Iron	... Fe5876
Radicals of	Carbonates	... CO ₃	...	5.7346
	Chlorides	... Cl	...	10.5893
	Nitrates	... NO ₃	...	1.2421
	Sulphates	... SO ₄	...	85.7706
	Silica	... SiO	...	2.7061
				<hr/>
				188.2898

NAMES OF THE COMPOUNDS NATURALLY CONTAINED
IN BATH WATER, AND THE QUANTITIES IN
GRAINS IN ONE GALLON.

Carbonate of Calcium	...	7.8402
Sulphate of Calcium	...	94.1080
Nitrate of Calcium5623
Carbonate of Magnesium		.5611
Chloride of Magnesium	...	15.2433
Chlorid of Sodium	...	15.1555
Sulphate of Sodium	...	23.1400
Sulphate of Potassium	...	6.7020
Nitrate of Ammonium	...	1.0540
Carbonate of Iron	...	1.2173
Silica	2.7061
		168.2698

With regard to the special gaseous impregnations of the waters, a careful analysis made by Mr. Gatehouse for this edition, (1890), shows the following results:

Carbonic Acid Gas 10.76 grs. per gal., equal to
78 parts per thousand by volume.

Oxygen 3.46 parts per thousand by volume.

Nitrogen 10.54 parts per thousand by volume.

The carbonic acid is essential in retaining several of the mineral ingredients of the water in a soluble state, and as it escapes readily the carbonates of iron, lime, and magnesia are deposited on articles in contact with it. The oxygen and nitrogen are evidently derived from the air, the excess of oxygen over that in the air being due to its greater solubility in the water.

Signed, J. W. GATEHOUSE.

It is expedient to state that the Bath Water is aërated by Mr. R. B. Cater. Formerly invalids who were unable to visit Bath for the waters, were supplied with it in stone flagons, at their own homes. From the volatile character of the various salts and other ingredients it contains, the water suffered considerable depreciation in its medical virtues. This disadvantage is now obviated. The process of aëration so successfully achieved by Mr. Cater insures to invalids at remote distances the Bath Water as it flows from the spring, except that it has been aërated just as soda water, seltzer, and many other natural and medicinal waters are aërated—namely by carbonic acid gas. But it may be added that, as an ordinary sparkling beverage, in combination with wine or spirits, it is not excelled by any of the numerous aërated waters extant. Indeed we may say that as a table water we regard it as unequalled.

According to our friend, Dr. Macpherson, (Bath, Contrexéville, and the Lime Sulphated Waters), there is a striking analogy between its chemical constituents and the cold Contrexéville water. It may therefore be naturally inferred, what is indeed a fact, that the Bath water when *taken cold*, as Sulis Water, is very similar in its action to the Contrexéville water, which has acquired a great reputation in gouty, biliary, urinary, and cutaneous affections, and also in diseases of the stomach and intestines.

Bathing.

WE do not hesitate to affirm, as a general proposition, that there is nothing more misleading than the information sought to be conveyed under the head of "Directions for Bathing." If the patient could always be trusted to understand his own symptoms the matter would be simple enough. "Directions for Bathing" are too often interpreted "How to save a Doctor"; in other words, "Directions for understanding my symptoms." In former times the practice of the Bath waters differed materially from the present system; and notwithstanding the more definite, and therefore more valuable knowledge, attained by the modern physician by scientific enquiry and experimental results, that advantage may be, and often is, lost by the rashness of the patient, or ignorant empiricism on the part of the practitioner. In the days of Peirce, Guidott, Jorden, and Venner, bathing was regulated more under the direct personal supervision of those eminent men. In the establishment of the first mentioned the results day by day, and hour by hour almost, were watched with careful notation and observation, and hence the greater relative value of the records of earlier times. In the later periods the practice and results of Spry and Wilkinson's personal experience at the

Kingston Baths possess great importance, because obviously they may be regarded as the foundation of modern practice. A few clear and practical directions for bathing we here formulate for those who will endeavour to understand and to act upon them with care, to note the results as minutely as possible, and to communicate them to their physician. The mutability and mutations of certain forms of disease under the Bath waters treatment are too well known to the experienced medical man, and he knows also the importance of attending to them and adapting his treatment to the changing phases of the disorder.

With respect to the habit of bathing by the strong and healthy, we have nothing more to say than that in most cases it is a laudable habit, but scarcely concerns us or the purpose we have in view. All we need add here is that every healthy person, who *is assured of a right habit of body for hot-water bathing*, may indulge in it with advantage in the preservation of that condition of health, especially in cases in which the mental and bodily faculties are severely taxed. But it is necessary that every person should regulate the habit both of drinking and bathing by the principles laid down in the later remarks.

The effects of the waters are seldom alike in different individuals, but generally speaking, in cases where their internal use is favourable, it is, as Dr. Wilbraham Falconer says, indicated by "a

glow of warmth in the stomach, an increased appetite, an improvement of the spirits, an augmented secretion of the saliva, and an excitement of the urinary discharge ; the latter constituting one of the best indications of their being likely to produce a good effect ; next to which may be placed the rapidity with which they quench thirst. If, however, they produce headache, thirst, a dry tongue, a sense of weight in the stomach, diminish rather than improve the appetite, induce nausea and sickness, and fail in promoting the flow of urine, they will be of no advantage unless their tendency to cause these effects can be obviated. This may in many instances be brought about by diminishing the doses, by altering the period of the day at which they are taken, by allowing the water to cool before drinking it, and especially by relinquishing their use before breakfast. The employment for a short time of some diuretic remedy, conjointly with the water, will aid in deciding its effect so as to augment the flow of urine. But if these changes are unattended by any corresponding result, no benefit can be expected from persisting in their use."

These results are more observed as the effect of modern treatment. In earlier times, that is from the beginning to the middle of the last century, the results were more uncertain, and this arose, in most cases, both in imbibition and bathing, from the recklessness of the patient. Those who are

tolerably familiar with the literature of the Bath waters, are equally familiar with the fact that the eminent physicians who practised in Bath had to contend with every conceivable prejudice produced by the indifference, the ignorance, and the empiricism of the earlier medical men of that century. In a curious pamphlet, written by Dr. John Summers, in 1751, he shows how difficult it was to overcome the prejudice which existed, not only in the public mind, but also in that of the leading physicians of the day, against the Bath thermal waters. In his dedication to Lord Dupplin, the President, and the Governors of the General Water Hospital, he quotes one of the reasons for its establishment, namely, "that this undertaking would contribute to render the nature and efficacy of the Bath Waters more certain and extensive, and thereby be a benefit to succeeding generations;" and after combating the prejudices and ignorance then existing on the subject, he tells us that "those who drink the waters do not bathe But what should have great force as to the point is, that there are many instances of people who, following the orders they had in London, only to drink the waters, finding themselves no better, or rather worse, have been prevailed upon to use the Bath, with such success as they themselves only should declare," and he shows the interdependence of the two processes in their action upon disease.

The whole value of treatment depends upon its

judicious modification in relation to the changes and variations of the disorder. In some cases a steady perseverance in a given course is not only safe but indispensable.

What we here desire to say is that no strictly definite instructions can be given on paper in cases of disease. The thermal treatment of each case depends more or less upon the individual patient.

We say it with all frankness and good faith that no more trustworthy and *general* directions can be given than those formulated by the late Dr. Randle Wilbraham Falconer, whose water practice was as extensive as his observations were valuable. He was especially careful to guard himself against their universal adoption, by saying "the above remarks are applicable only as *general rules*."

"The best time for taking a bath is early in the morning, during the warm months of the year, though it is usual to select an hour between two and five o'clock, in the spring and autumn, and an earlier hour during the winter. But it may be employed generally at any period of the day, provided it be not soon after, or only a short time before a meal.

"The temperature of the Bath, under ordinary circumstances, should not exceed 95° or 97° F. A higher degree of heat ought never to be resorted to except by special direction."

"When the waters are used as a Bath, a slight shock, accompanied with chilliness, is often experienced, on first entering the water, which soon

passes away, and is succeeded by a grateful sensation of warmth. The frequency of the pulse and the temperature of the body are increased, and subsequently the amount of the urinary discharge augmented. After the use of the bath, there is a consciousness of elasticity and vigour of the frame and the appetite is improved. The exhausting perspiration and fainting which often follow the use of warm baths of ordinary water, rarely if ever, occur after the employment of mineral water, neither is its use productive, under ordinary circumstances, of the copious perspiration consequent on common hot baths."

"When the use of the bath is attended with marked redness of the skin, flushing of the face, and giddiness, the temperature of the water should be lowered, and the period for employing it diminished, until both are adapted to the requirements of the case."

We fully coincide with the foregoing remarks, and we make no apology for quoting them. They are general, and in point of clearness and simplicity cannot be misunderstood. We can see no use in multiplying words to express a generally accepted theory. Dr. Falconer's book is now public property, and whilst we cordially accept his teaching, we at the same time concur with him in the sentiment that no rule can be invariably followed, and it is valuable or mischievous in proportion to its judicious modification in relation to the changing symptoms.

With reference to the several facts of the "Continental System," i.e., massage, in all its varied forms and methods, we hold that any attempt to give a popular and comprehensive description of these would be mischievous as a rule, and in some cases dangerous. There is always a tendency on the part of a certain class of patients to diagnose their own symptoms, and to regard the *modus operandi* set forth in a general formula, requiring skilful experience as to its adoption, as one of invariable application. No modern system demands more careful discrimination in its use than the various mechanical devices which have been brought into operation by this system as subsidiary processes, to aid or hasten the cure of certain forms of chronic affections by the thermal waters. What good then, we ask, can result from an elaborate and minute explanation of contrivances of this nature without a practical and definite object? The medical practitioner who is not familiar with modern thermal practice, will find enough for his general guidance in our remarks on Treatment.

The "Continental System" is not a new system. It is new in connection with our thermal treatment only in the sense of its more mature and perfect development, and in the wise and more ample provision made for its scientific, varied, and adequate application. But in some respects, it is open to the danger common to novel and untried

methods, that is of unmitigated empiricism. A "goes in" for "massage" and all its concomitants to "get a name;" B 'goes in' not for the same thing alone, but he damnifies older, but nevertheless long tried, and in many respects, not less potent treatment; C looks wise, poses with the air of an eastern potentate, and then utters the magic word "Massage." This would be all very amusing, if it were not fraught with so much immediate danger, and did not contain the seeds of latent mischief. The potential value of massage, as a remedial agent, is incalculable. But in estimating its effects upon a patient, there are various elements to be considered—the temperament, the powers of resistance, and the general constitution of the patient; and therefore it follows that in the great majority of cases a careful medical diagnosis should precede the employment of massage and kindred treatment.



The Baths.

THE KING'S AND QUEEN'S PUBLIC AND
PRIVATE BATHS,
WITH THE "CONTINENTAL SYSTEM."

[See No. 1 on the Plan.]



ROUND the vestibule of the King's and Queen's baths, the entrance to which is from Stall Street, will be found four baths, one of which is a reclining bath, the other three are large deep baths, having steps leading down into them, each holding about 860 gallons of water, with a depth of four feet six inches. In each there is a douche for the local application of the water, if, and when, required, while the bather is in the bath; the rooms are lofty, well lighted, and each is fitted with electric bells. By the entrance to the pump room, and opposite to a consulting room for use of medical men, is a staircase which leads to the older portion of the King's bath, as well as to the open public bath, which is open to the sky, the dimensions being 59 feet in length, nearly 40 feet in breadth, and contains, when full, 56,332 gallons of water, with a depth of $4\frac{1}{2}$ feet.

On the south side there is a stone chair and bench, the former bearing the following inscription, "ANASTASIA GREW GAVE THIS, 1739."

Above the stone chair is a mural tablet recording the gift of an ornamental balustrade for the bath, in 1697, by Sir Francis Stonor, whose portrait may be seen.

Not far distant from this is a figure of Bladud in a sitting posture, and below it an inscription on copper, dated 1699. According to Stukeley, the statue formerly occupied a niche in the North Gate above the arch. In 1636 the same figure was supposed to represent King Edward III. It was taken down from thence and somewhat altered by a common mason to represent King Bladud, and then transferred to the Bath.

Many of the brazen rings, attached to the walls of the bath, commemorate the benefits received by the donors from the use of the waters ; others were placed there for the use of bathers by the Corporation. There were formerly 208 rings in all the baths, of which only twenty-nine remain at the present time. Some were stolen and sold for old brass, one or two of which have been recovered.

Returning again to the main vestibule, there is a short passage with mosaic floor, in which is worked "Queen's Baths, formally opened by H.R.H. the Duchess of Albany, 13th June, 1889." The central hall, 42 feet by 16 feet, is used as a cooling room, and is elegantly fitted up with every comfort for the patient, the floor being a precise copy of the Roman tessellated pavement which was found in 1859 in Bridewell lane, and which is now to be

seen at the Royal Mineral Water Hospital. It is composed of large tesserae, formed into various patterns, the coloured marbles of which are of remarkable brilliancy, the whole being in fact an excellent imitation of the ancient design, which is suggestive of the earlier part of the second century. The dado and doors are of Spanish walnut, and the roof of carved oak. Opening out of the cooling room are several dressing rooms leading to various Aix massage douche rooms, which are large and lofty, about 14 feet by 10 feet, with vaulted ceilings, 19 feet in height. The fittings, which are of aluminium, comprise double hose for douching, and also showers and feather douches. Each douche chamber has two dressing rooms attached, furnished with luxurious sofas and chairs, and fitted with marble slabs, electric bells, and gas stoves, the floors being paved with ceramic mosaics. One douche room, the fittings of which are nickle plated, is especially set apart for ladies. At the further end of the cooling room, is an oil painting of Christopher Anstey, the poet, facing which are two reclining baths, one being fitted with an apparatus called a lumbar douche, for giving a spray in the bath in cases of lumbago, &c. On the west side of the cooling room a door leads to a wide corridor, passing the grand staircase, on the left; on the right of this is a lift for lowering wheel chairs to the basement floor, where there are two reclining baths, and three deep baths, one

being fitted with a hydraulic lift for raising or lowering an invalid chair into the water. At the end of the corridor is a large room fitted with a box vapour, either for mineral or spring water ; a needle and shower bath, as well as an ascendante douche. Dry heat can be given in this room up to about 150° F. or moist heat to 98° F. A special apparatus has also been fitted for applying a hot local douche in vertebral and lumbago cases.

Descending the grand staircase, at the foot of which will be found the remains of the Roman hypocaust, a perfect relic of the Roman period, it will be observed that the modern building rests in many places upon the Roman walls. On this floor will be found a Carlsbad reclining bath, in which a patient can receive massage, the bath being also fitted for the administration of the Scottish douche, by which hot and cold mineral water descends upon the patient with great force, the bath being surrounded by removable waterproof curtains: in addition, there is also fitted to this bath a crane lift, used for the purpose of lifting a patient into the bath, either in a horizontal or sitting posture. In the adjoining bath room single or double Aix massage can be given ; there is also a reclining bath ; and in one corner is a very excellent Sitz-bath by Badet, of Paris. There are three other reclining baths upon the same floor, all of which are provided with the graduated douche and shower, together with a graduated enema or lave

bath. Isolated from these baths but on the same floor is a bath, with dressing room and water closet adjoining, for special medicated baths, fitted up with every comfort ; it is supplied with graduated douche, shower and feather douche, and a graduated enema or lave. Although these baths are below the level of the pavement, they are illumined with prismatic lights, and the walls are all lined with white tiles. On the east side of the cooling room there are two large rooms, with a handsome ceramic mosaic floor for pulverization and inhalation. In the pulverization room are six separate apparatus for atomizing the Bath waters by the aid of steam, or, if necessary, for using the water in connection with medicated tinctures. There are also four apparatus for spraying the ear, eye, or throat. The inhalation room is fitted with a shallow octagonal shaped marble basin, above which is suspended a metal umbrella, the required vapour being produced by several jets of hot mineral water, atomized by striking the inside of the umbrella ; the temperature of the room is usually maintained at 72° , which can be increased if required.

BERTHOLLET VAPOUR AND SHOWER BATH.

In order to utilize the vapour from the springs, rooms have been fitted up, adjoining the King's bath, with all the appliances which science can suggest and experience recommend. In one corner of

an apartment, tiled throughout, and laid with a tessellated pavement, is an ingenious box-like structure, in which a patient is seated, the whole of his body, (with the exception of his head, for which an opening is especially provided at the top,) being subjected to the action of the vapour which rises in full volume direct from the springs beneath. Through a central reservoir, or drum, in another part of the room the vapour is conveyed in various ways, being either inhaled or locally applied by means of very ingenious contrivances. In cases of gout, rheumatism, or any of the varied forms of skin disease, such facilities are invaluable, the treatment being proved to be most efficacious. At no other spa, either in England, or on the Continent, can the water or the vapour be used to such advantage. This is explained by the fact that the natural temperature of the Bath water is so high, ranging from 112° to 120° . Throughout the new baths there are admirable lavatories, furnished with hot and cold water and other necessities; as well as hot closets for keeping the linen, racks for drying bathing dresses and carpets; and electric bells and indicators on every floor. The appointments of the baths are in every respect as complete as they can be made, whether as regards the comfort of the bathers, the efficiency of the appliances, or those æsthetic considerations which modern taste and refinement can suggest.

The King's bath may be regarded, historically, as the oldest in the system of baths. It was, undoubted-

ly, in the time of the Romans, the most capacious as well as the most luxurious of all the noble series of baths then constructed ; and so, of the open or uncovered baths, it continues. Beneath the bath the spring rises over a surface of about 40 feet square. Around these springs the Romans formed a reservoir, octagonal in shape, 40 feet at its narrowest and 49 feet at its widest part. The walls forming the reservoir were 3 feet in width, built of solid block stone, and lined with lead, varying in thickness from $\frac{5}{8}$ -in. to 1 inch. From this reservoir the water was conveyed by pipes and ducts to the various baths around. The destruction which followed the departure of the Romans caused these Baths to be filled with *débris*, which in course of time formed a foundation, through which the water forced its way. Formerly a stone floor was laid, so perforated as to admit the rising springs. This floor, with the accumulation of *débris* beneath, has been removed down to the Roman level, and the Roman reservoirs again serve their original purpose. The whole space is covered by arches of cement and concrete, the upper surface forming the floor of the present King's Bath.

THE QUEEN'S BATH [LATE].

The opening up of the Roman remains necessitated the removal of this bath.

It received its name from the following circumstance :—As Anne, the queen of King James the

First, was bathing in the King's Bath, there arose from the bottom of the cistern, just by the side of Her Majesty, a flame of fire like a candle, which had no sooner ascended to the top of the water than it spread itself upon the surface into a large circle of light, and then became extinct. This so frightened the queen, that, notwithstanding the physicians assured her the light proceeded from a natural cause, yet she would bathe no more in the King's Bath, but betook herself to the New Bath, where there were no springs to cause the like phenomenon; and from thence the cistern was called the Queen's Bath. It was soon enlarged, and the citizens erecting a tower or cross in the middle of it, in honour of the queen, finishing it at the top with the figure of the Crown of England over a globe, on which was written in letters of gold, ANNA REGINA SACRUM.

Although there is no longer a "Queen's Bath," this notice is inserted with a view to the preservation of the historical interest.

THE ROYAL PRIVATE AND HOT BATHS.

See No. 2 on the Plan.

Immediately opposite to the old Hetling Pump Room are the Royal Private Baths and the Hot Bath.

The Hot Bath, which is an open bath, is situated in the centre of the Royal Private Baths. The

entrance to it is at the southern end of Hot Bath Street. This bath is of an octagonal form and its architectural embellishments are well deserving of notice. At the four corners of the bath there are small seats for the bathers, adjoining which is a large dressing room for the free use of hospital patients and others who use this bath ; leading from the dressing room will be found a reclining bath, fitted with douche, also a local douche, and a box vapour. The temperature of the spring, which rises seventeen feet below the pavement of the bath, is 120° F., while the temperature of the water varies in different parts from 105° F. to 112° F.

THE ROYAL PRIVATE BATHS AND DOUCHE.

The chief approach to these baths is under a semi-circular covered way, from an entrance at the northern end of Hot Bath Street, opposite to the Hetling* Pump Room. There are four principal baths.

The first, the BLADUD or MARBLE BATH, is a small bath, the arrangements of which are admirable. There is a dressing-room adjoining it, with every requisite convenience. The second, or ALFRED'S BATH, contains, when filled, 724 gallons of water, with a depth of four feet and a-half, and has a dressing-room attached to it. Adjoining this

* This term "Hetling" has no distinctive meaning. It is local and modern. A wine merchant of that name formerly occupied Hungerford House and other premises near and around, and hence his name comes to be associated with the neighbourhood.

room is another dressing room communicating with a douche room, having all the necessary arrangements for the use of the douche. Beyond this is a dressing room, connected with the third or CHAIR BATH, containing an arm chair, attached to a crane, by means of which a helpless invalid can safely be let down into and raised up from the bath. Adjoining this bath is a dressing-room having in it a shower bath. This room is also connected with a small chamber, containing the lavement apparatus and ascending douche.

Adjoining the last mentioned room is the EDWIN'S BATH, attached to which are a dressing room and douche apparatus.

All the above-mentioned baths in this establishment have arrangements in them for the sub-aqueous douche.

Near this bath is a room containing a large reclining bath.

In some of the rooms have been fitted the apparatus for the Aix massage douche, in conjunction with the deep bath.

TEPID SWIMMING BATH.

After leaving the last-mentioned bath, a passage leads to the large tepid swimming bath. Its form is an oval of sixty-two feet by twenty-three feet. On the eastern side are dressing rooms, and two large public dressing rooms. From each of these rooms a flight of steps leads into the bath.

The water is supplied from the spring in the King's bath, and from the cold water reservoir; its temperature is 88° Fahr. There is also a separate entrance to the bath through the piazza in Bath Street, opposite St. Catherine's Hospital.

THE NEW ROYAL PRIVATE BATHS.

See No 3 on the Plan.

The ground plan of these baths—which are attached to and form part of the Grand Pump Room Hotel—is a long parallelogram, divided in the centre by a corridor lighted at the top, with baths and dressing rooms arranged on each side.

There are six bath rooms, each fifteen feet long by eleven feet and a half high. The baths—which in form resemble those of the King's and Queen's baths—are of a T shape, and measure, in length 7 ft. 2 in., and at the broadest part 10 ft., and 4 ft. 8 in. deep. To each bath room, a dressing room is attached, with a water-closet adjoining.

There are three reclining baths, with dressing rooms attached; and also two dry douche baths, fitted with graduated douche, feather douche, and Aix rose douche. One room has also been fitted with a needle douche, and the Ragatz reclining bath has an apparatus fixed for Aix douche, with massage, with one attendant if required.

The swimming bath is at the end of the corridor,

and is a magnificent bath, of enormous capacity, sumptuously appointed, and may fairly challenge comparison with any similar bath in the world.

At the end of the long corridor are two luxuriously furnished cooling rooms, one for ladies and the other for gentlemen. Adjoining the gentlemen's room is a comfortable smoking room, furnished with the daily papers.

From the Grand Pump Room Hotel, on the ground floor there is a communication with the entrance lobby of these suites of baths, and a lift, by means of which infirm invalids can be brought down from the landings of the hotel to a level with the corridor, through which, in a merlin chair, they may be wheeled to the baths or douches, repacked in their chairs, and taken back to bed in their blankets.

THE CROSS BATH.

See No. 4 on the Plan.

This is a public bath. The spring supplying it rises at a depth of fourteen feet below the flooring of the bath, and yields half a hogshead of water a minute. The temperature of the water at the depth mentioned is 104° F.; that of the bath generally, 96° to 98° F.

The present edifice was erected from plans by Mr. Baldwin, in 1790. In the centre of the bath,

there formerly stood an elaborate structure surmounted by a cross, which was erected by John Drummond, Earl of Melfort, Secretary of State to James II., in commemoration of the Queen. (Mary of Modena,) having used this bath, with happy results, in 1688. Around the bath are arranged fourteen convenient dressing closets, with lavatory adjoining. Bathers bring towels with them, or they are supplied by the attendant, for which there is a small additional charge.

The bath has been recently repaired and improved. The reservoir has been much enlarged by the removal of the accumulated rubbish of centuries, and is now largely frequented by the boys of Bath. On Thursdays this bath is reserved for females, and is under the charge of a qualified attendant.



Grand Pump Room.

The earlier pump room was begun in 1704 and completed in 1706. It has been sometimes attributed to the sole exertions of Nash ; but, except indirectly, he had nothing to do with it. As visitors came in large numbers to the city the corporation found it necessary to make adequate provision for their accommodation. The rude method that for two centuries had prevailed in connection with the drinking of the waters, which was not only inconvenient, but did not at all times ensure them from defilement, was no longer endurable, and the corporation perceived the importance of making the waters subservient to the interests of the city. The building stood upon a part of the site of the present pump room, but was much smaller. Those who are acquainted with the caricatures of the last century, especially the earlier part of it, will be familiar with the peculiar phases of pump-room life and habits of the period. Many writers who indulge in *tall talk* about the palmy days of Bath, know little of the subject. Nearly all these writers associate the pump room with the gambling and all the other vicious habits of the time. It had nothing to do with them. The foppery, unreality, and extravagant affectation as openly seen in society, and especially in the old pump room, were comparatively innocent and

harmless. If the pigeons were caught in the places of public and private resort, they were plucked in the "hells" especially provided for the purpose by Nash and his myrmidons. In this practical age, to men of wide-a-wakes, knickerbockers, short jackets, short pipes, and short manners, and amongst women of that combination of simplicity in head gear and ordinary sensible attire, with an occasional imitation of the masculine talk and ways of men, the Bath beau and the lady of fashion of Nash's age, are objects of scorn and derision. The modern gentleman, who after his matutinal tubbing, takes three minutes to "slip into his bags," looks upon one of those ancient ladies and gentlemen of the period, whom it has repeatedly taken two mortal hours to get into that surrounding of ineffable finery and to paint over the ravages that time or dissipation has made in those visages, is aghast at such "laboured nothings."

The Bath beau and the Bath beauty were not always of the gambling class, but it would be difficult to believe that even the best of them were not of the earth earthy.

In 1751 and again in 1781 the room was enlarged, and the appliances to serve the drinker were improved, but towards the close of the century it was found to be altogether inadequate for the purpose, and in 1794 it was pulled down, plans being prepared for the present structure by Baldwin, the city architect.

The interior of the building is set round with three-quarter columns of the Corinthian order, crowned with an entablature. In length it is eighty-five feet, in breadth fifty-six, and in height thirty-four, affording ample space for promenading, to those who drink the waters. In the recess at its eastern end is a marble statue of Beau Nash, executed by Prince Hoare; the right hand of the figure rests upon a pedestal, on the face of which is delineated a plan of the Royal Mineral Water Hospital, towards the establishment of which national charity he greatly contributed, by his exertions, in obtaining donations of money, and of which he was one of the treasurers from the time that it was opened for the reception of patients, in 1742, until his decease in 1761. At the western end is an orchestra for the band, which is of a high class, and plays on stated days during the winter months of the year. There are three entrances on the northern side; opposite the principal entrance, within an apse on the southern side, is a fountain for the drinkers. This fountain is supplied direct from the spring, with a continuous stream of mineral water, at a temperature of 114° F. The supply of water from the spring to the fountain amounts to eight gallons and a half a minute.

In this apse there is a window with five lights, of which four have been filled with coloured glass, representing historical subjects as follows :

1. Bladud and the Pigs ; the gift of Mr. Radway
2. Roman Soldiers; the gift of Mr. R. B. Cater.
3. The Crowning of Edgar ; the gift of some members of the Medical Profession and others.
4. The Visit of Queen Elizabeth ; the gift of Colonel Laurie, C.B., M.P.
5. Yet to be filled.

This room is open on ordinary days from 8.30 a.m. to 6 p.m. during the whole year ; on Sundays from 12.15 p.m. to 2 p.m. throughout the year. There is a convenient entrance to the King's Baths.

[The following verses are seldom quoted fully or correctly, they have been almost invariably attributed to Lord Chesterfield, but they were written by the famous Mrs. Brereton. It appears that the former once quoted them, and hence they were supposed to have been written by him instead of the eminent lady to whose pen they belong.]

On Mr. Nash's Picture,

AT FULL LENGTH BETWEEN THE BUSTS
OF SIR ISAAC NEWTON AND MR. POPE, AT BATH.

THE old Ægyptians hid their wit,
In hieroglyphic dress,
To give men pains in search of it,
And please themselves with guess.

Moderns, to hit the self-same path,
And exercise their parts,
Place figures in a room at Bath :
Forgive them, God of Arts !

Newton, if I can judge aright,
All wisdom does express ;
His knowledge gives mankind delight,
Adds to their happiness.

Pope is the emblem of true wit,
The sunshine of the mind ;
Read o'er his works in search of it,
You'll endless pleasure find.

Nash represents man in the mass,
Made up of wrong and right ;
Sometimes a King, sometimes an Ass ;
Now blunt and now polite.

The picture plac'd the busts between,
Adds to the thought much strength,
Wisdom and wit are little seen,
But Folly at full length.



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Notices of the Press.

FIRST EDITION.

INVALIDS going to Bath cannot do better than read a little book by Dr. Fox, the well-known physician of that city, entitled "A Short Manual of the Bath Mineral Waters," from which I have derived much interesting and useful information. His hints respecting the cure of the waters are refreshingly free from professional jargon, and thoroughly practical and judicious. Dr. Fox's candour inspires a layman with confidence, for he does not pretend to regard the Bath waters as a sure, certain, and speedy panacea for all possible complaints; and he is rather disposed to advise caution in their use, and is of opinion that there is some danger of using the new mode of treatment, which has lately been introduced, rather too indiscriminately. Of course, any excess in this direction would in the long run be calculated to diminish the high reputation of the Bath waters. Dr. Fox discusses their application in the various diseases for which he considers they are likely to prove most beneficial, and his remarks may certainly be read with profit by those who are suffering from any of the maladies for which Bath is regarded as one of the great cures. I decidedly do think that invalids who are ordered to Aix-les-Bains, Wiesbaden, Wildbad, and other Continental watering places, would do well to give Bath a first trial, whereby they will probably achieve their object more comfortably, and at a great saving of time and money.—*Truth*.

A SHORT MANUAL OF THE BATH MINERAL WATERS.
by A. E. W. Fox, M.B., F.R.C.P.E. Crown 8vo,
pp. 88. London: Simpkin, Marshall & Co.

Dr. Fox's work is short and compendious. He first gives an account of the Bath waters in their old days, and in the words of Dr. E. Turner and Dr. John Jones, who wrote about them

three hundred years ago. He then proceeds to give his own views respecting the uses of the waters, and discusses their application in rheumatism, rheumatic gout, gout, dyspepsia, diseases of the skin, of the nervous system, in anæmia and malaria, and in uterine affections. He is judicious throughout, and is cautious and guarded in giving his opinions. He does not, like many others, regard the Bath waters as a panacea ; indeed, in a certain sense, his book may be regarded as a protest against the extravagant use of Bath waters in all possible diseases, as also of the modes of treatment lately introduced into that place from abroad, which are apt to be used somewhat indiscriminately.

A recent visit to some of the larger foreign spas has forced on us the consideration that at many of them the various new or newly revived subsidiary portions of treatment are superseding the ordinary use of mineral waters. The same tendency is very observable at home, and in other directions besides that of mineral waters. It is an important feature of present medical practice.—*British Medical Journal*, Dec. 1st, 1888.



BATH SULIS WATER.

THE NATURAL MINERAL WATER OF BATH, AERATED.

"Supreme among Table Waters."

UNEQUALLED FOR GOUT & RHEUMATISM,

R. B. CATER, *Sole Lessee.*

THE SPRINGS, GRAND PUMP ROOM, BATH.

SULIS WATER, IN ITS MEDICAL AND GENERAL ASPECTS.

ATTEMPTS to aerate the Bath Waters have until now only imperfectly succeeded, or altogether failed, partly owing, it may be, to inadequate machinery, and partly to the fact that no sufficient prospect of final success existed to stimulate the efforts of those by whom they were made.

In the process of aëration the experiments have been made under exceptionally favourable conditions, not perhaps open to those who have conducted former experiments. No expense has been spared, the lessee having been privileged to intercept the Waters at their source, whilst the most perfect appliances have been used, together with eminent scientific assistance. The experiments have succeeded beyond all expectations, notwithstanding the anticipation of many scientific men who predicted failure. In 1878, the British Medical Association met in Bath, and on that occasion the lessee submitted to that learned body the first perfect example of Sulis Water.

The aëration of Mineral Waters is by no means novel. It has been attempted more or less successfully in the case of many Natural Mineral Waters, sometimes for the purpose of making them more agreeable to the taste, and at others to prevent them deteriorating or decomposing by time; but besides these in the case of the Bath Waters, more important objects are aimed at, and without wishing to be tedious, those objects are here scientifically explained.

The Mineral Waters of Bath present the paradox of being at once the most permanent and yet the most unstable of fluids—permanent, because no appreciable change has taken place in their constituents since their discovery ages ago, but yet unstable, owing to the fact that from the moment of issuing from their source a change takes place, which progresses as the water cools by a process of oxidation from contact with the air, but which, by the perfect system now adopted, can be *prevented*. These waters, among other constituents, contain iron, but in a peculiar and more than usually active form—namely, that of Carbonate of Iron. This substance is of a highly evanescent character. It can easily be prepared in the laboratory, but, to use the words from a well known treatise on chemistry, "it can-

not be washed and dried without losing carbonic acid and absorbing oxygen. Such waters are known by the rusty matter they deposit by exposure to the air." This latter fact is well known to those who have taken the Bath Waters: the peculiar discoloration on the drinking glasses used at the Pump Room is due to a deposit of what originally was Carbonate of Iron, but which, having lost its carbonic acid by decomposition, now assumes the form of the almost inert oxide.

Now, it is a well known medical fact, that the administration of the Carbonate of Iron in mineral water is often more beneficial as a chalybeate than a much larger quantity of other ferruginous compounds, but its instability which we have explained prevents its use as a medicine. The Bath Waters contain this substance when drawn from the spring, but in few minutes or, at most, hours, they no longer contain it, but in its place a small quantity of oxides.

To remedy this defect, and to enable patients at a distance to reap much of the advantages of a visit to Bath, is the object of this process of aëration. The change of Carbonate to Oxide of Iron will not take place in the presence of Carbonic Acid Gas, and therefore advantage has been taken of this chemical fact to saturate the Waters with the gas, and thus to preserve them (with the exception of temperature) in their original state as they issue from the spring.

It should, however, be stated in the strongest manner that this process makes *no alteration whatever* in the chemical constitution of the Waters. In drinking Sulis Water, a person is drinking Bath Water, pure and simple, *plus* Carbonic Acid Gas, this addition having a threefold object—1st, to render the Water a refreshing and agreeable beverage; 2nd, to maintain its medical virtues unimpaired for any length of time; and 3rd, and most important of all, to preserve one of the most important chemical constituents in its original activity as when bubbling from its natural source.

To those who are unable to visit the Baths and obtain the benefit of the combined external and internal use of the Thermal Waters, a prolonged course of Sulis Water is the next efficacious thing. In those mild but troublesome conditions of skin irritation, which arises from many causes—change of season, alteration of temperature, disordered digestion, &c.—Sulis Water regularly taken for a few weeks, will not only be a pleasant and cooling beverage, but prove a most valuable remedial treatment. Indeed, there are few cases of skin disease which will not receive benefit from its use. It is an excellent tonic, does not distend or weaken the stomach; and it must be emphatically observed that, independent of all medical considerations, experience shows that there is no mineral water that is more agreeable or more suited to the robust and healthy than *Bath Sulis Water*.



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